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FINAL ENVIRONMENTAL IMPACT REPORT

Union Square Redevelopment

EEA# 15889

Submitted to:
Executive Office of Energy
and Environmental Affairs
MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

Submitted by:
Union Square RELP Master Developer LLC
And
Somerville Redevelopment Authority

Prepared by:
Epsilon Associates, Inc.
3 Mill & Main Place, Suite 250
Maynard, MA 01754

In Association with:
DLA Piper
Stantec
bKL Architecture, LLC
SGA
RW Sullivan Engineering
AHA Consulting Engineers

May 15, 2019

Epsilon

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Epsilon
ASSOCIATES INC.

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Project Description and Permitting

1.0 PROJECT DESCRIPTION AND PERMITTING

1.1 Introduction

Union Square RELP Master Developer LLC (hereinafter "US2") and Somerville Redevelopment Authority ("SRA") (together, the "Proponent") propose the Union Square Redevelopment Project which includes the redevelopment of approximately 15.1 acres in the Union Square neighborhood of Somerville (the "Project"). The site is made up of seven development blocks or portions of blocks known as the "D Parcels" (also referred to herein collectively as "D Blocks" and each individually as a "D Block") which were designated for redevelopment in the approved Union Square Revitalization Plan, an urban renewal plan pursuant to M.G.L. Chapter 121B (EEA# 15032). The Project is the product of a decade of community-based planning processes (see Attachment 2, Section 3 of the Environmental Notification Form [ENF] dated July 2, 2018 for additional Public Process Details). The Project will transform lower-density primarily vacant sites with automotive and industrial uses into a vibrant transit-oriented mixed-use employment center organized around Smart Growth principles, achieving the City of Somerville's (the "City") and community's long-term vision for the neighborhood. The revitalization of the D Blocks is being spurred by the introduction of new transit to the neighborhood via the ongoing $2.3 billion Green Line Extension transit project which is being funded by the Federal government, the Commonwealth of Massachusetts, the City of Somerville and the City of Cambridge (the "GLX").

This Final Environmental Impact Report (FEIR) responds to the Secretary of Energy and Environmental Affairs Certificate issued on the Draft Environmental Impact Report (DEIR) on March 8, 2019 (the "DEIR Certificate"). As requested in the DEIR Certificate, this FEIR includes the following:

Chapter 1: Project Description and Permitting. An updated Project description, including changes since the DEIR, phasing information, additional details about the development on the D2 Block, details about the civic open spaces proposed across the Project site; discussion of the City's infrastructure improvements in Union Square; coordination with the GLX project; discussion of permits and approvals; and a discussion of the permitting and review process.

Chapter 2: Traffic and Transportation. Additional transportation information, including details of the Pedestrian Level of Service analysis methodology used for the analysis in the DEIR; discussion of the need for, and appropriateness of, mitigation measures to correct safety-related deficiencies at a limited number of study area intersections; details of the shared parking model used for the analysis in the DEIR; an outline of the proposed transportation mitigation; discussion of metrics to identify potential transportation improvements and a list of potential improvements by transportation mode; discussion of bus stop improvements; and the traffic monitoring plan.

Chapter 3: Greenhouse Gas Analysis. An updated and expanded greenhouse gas emissions analysis that outlines modeled design changes since the DEIR; presents and analyzes feasibility of constructing buildings to a Passive House standard; analyzes an aggressive approach to

electrification of the Project; addresses the Project's consistency with the City's future carbon neutrality goal; investigates productivity of renewable energy sources for the Project, outlines Green Vehicle infrastructure; and articulates associated commitments.

Chapter 4: Stormwater. Additional information regarding the Project's stormwater management approach, including information related to the stormwater connection to the Massachusetts Bay Transportation Authority stormwater system and how the system will be used, as well as additional information regarding on-site resiliency.

Chapter 5: Mitigation and Proposed Section 61 Findings. An updated list of mitigation measures and proposed Section 61 Findings, including a table of mitigation, schedule and estimated cost by anticipated Project phase.

Chapter 6: Response to DEIR Comments. Response to comments submitted on the DEIR. Revised response to comments submitted on the ENF are included in Appendix F.

1.2 Project Description

As requested in the DEIR, this section provides an update on changes to the Project since the DEIR, a Project description with phasing information, larger printouts of Project site plans, more detailed plans of the D2 site and proposed D2 buildings, and more details regarding the Project's civic open spaces.

1.2.1 Changes Since the Draft Environmental Impact Review

The Project site and program have not changed since the filing of the DEIR. However, the design and mitigation commitments have changed. The following summarizes key changes to the Project since the filing of the DEIR, which were made in response to public and community comments (including from the Union Square Neighborhood Council), the MEPA process and input from the GLX project team and other agencies, and discussions with the City, including its planning staff and Planning Board as part of the City's Design and Site Plan Review (DSPR) process:

- **Expanded Public Open Space.** US2 has committed to increase the size of the D2 plaza, the publicly accessible open space included in the Project's first phase, by at least 33% from what is currently required as part of the master planning zoning process that led to the City's issuance of the Coordinated Development Special Permit (CDSP). This additional open space is discussed in detail in Section 1.2.4.4 and results in the Project's civic open space total being increased from approximately 108,600 square feet (sf) to approximately 113,600 sf.

- **Reduced D2 Parking Counts.** In response to community feedback during the DSPR process, US2 reduced the number of parking spaces in the first phase from approximately 290 spaces to approximately 270 spaces, made the residential building footprint more compact and created the additional open space described above.

- **Expanded Green Building, Energy Conservation and Greenhouse Gas Emissions Mitigation.** US2 has committed to additional greenhouse gas (GHG) emissions reduction in response to comments raised on the DEIR and to state and community comments. These additional mitigation items include, but are not limited to:
    - The delivery of a multi-family, Passive House project on D4.3;
    - Building envelope performance better than prescriptive code levels for all buildings;
    - Improved reductions in the stationary source GHG emissions from baseline by Project phase (as baseline is defined in the DEIR);
    - Commitment to reserve at least 40,000 sf of rooftop area for future photovoltaics;
    - Green power purchase for 100% of Phase 1's power needs for 10 years;
    - Green vehicle use is promoted by designating 191 commercial parking spaces within the Project as parking spaces that include one of the following: EV charging infrastructure, EV-ready infrastructure, preference for low energy vehicles or fuel efficient vehicles, dedication to car sharing services, or prioritization for carpooling participants.
- **Additional Transportation Mitigation Measures.** US2 has made the following additional commitments to transportation demand management in order to further mitigate Project environmental impacts:
    - A commitment to work with the City and Massachusetts Department of Transportation (MassDOT) to identify specific metrics that would be monitored and that would indicate the need to consider modifications to the transportation network as the area evolves, and to identify potential interventions by mode.
    - Additional commitments to transportation and mobility monitoring and reporting.
    - Deployment of quick traffic calming and multi-modal safety investments in the Project area. $0.4 million of the total infrastructure and future phase contributions have been designated as rapid response transportation mitigation funds to be used for rapid response mobility retrofits in the Project area. This is in addition to $5.8 million for the GLX project; $4.6 million in offsite infrastructure contributions for planned improvements including Complete Streets; and $3.4 million of additional Future Phase mitigation that the City can also deploy at their discretion to address future transit, transportation, infrastructure or other community needs.
    - US2 has joined the Massachusetts Bay Transportation Authority (MBTA) Perq Program and has committed to require commercial tenants, as part of their lease, to participate in the MBTA Perq Program as further detailed herein.

- Improve the accessibility and comfort of six existing bus stops that reside on Project frontages.

- **Design and Coordination Changes to Accommodate MBTA and GLX Requests**. US2 has been working with the MBTA and GLX project team for several years to coordinate between the two projects relative to construction logistics, schedule, design and operations. The details of the ongoing coordination are discussed in Section 1.3. Since the DEIR, US2 has made the following additional commitments in the interest of enabling the GLX project and ensuring the two projects work in concert:

  - Affirmed its commitment to provide the following improvements on D2 to facilitate Union Square Station: create a plaza that includes an Americans with Disabilities Act (ADA) compliant path from the station platform to the Prospect Street sidewalk at Bennett Court; construct an employee lounge, janitor's closet and restroom; provide a drop-off area for The Ride paratransit program; and provide 120 bicycle parking spaces.

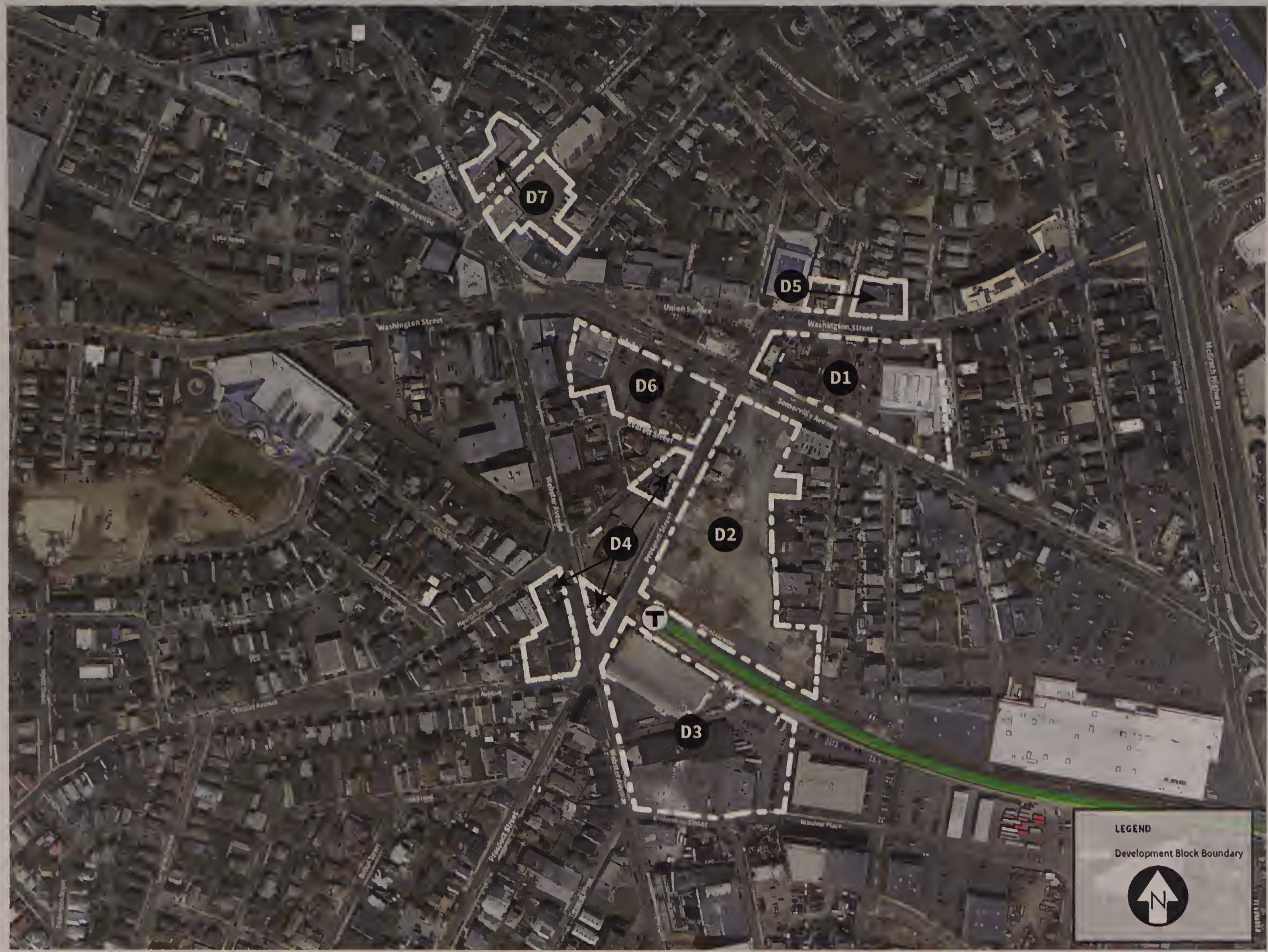
  - Agreed to allow the MBTA to connect to a proposed watermain on the D2 site so that water could be provided to the station area at a lower cost to the GLX/MBTA.

  - US2 will continue to coordinate with the City, MBTA and GLX to identify a solution for the provision of an MBTA elevator at Union Square Station to serve MBTA patrons south of the station. To that end, US2 has offered to amend the D2 design to make way for the elevator and/or install an accompanying stair; to grant an easement for the elevator area at no cost to the MBTA; and to share the cost for the MBTA elevator to the station.

1.2.2 Project Site

Each D Block, as shown in Figures 1-1 and 1-2, consists of one or more lots; some D Blocks (D1, D2, D3 and D6) comprise contiguous lots and some D Blocks (D4, D5 and D7) are an assemblage of largely or completely non-contiguous lots. Many of the D Blocks currently have multiple owners and some currently include existing businesses. The Project site includes all of the parcels in aggregate and totals approximately 659,343 square feet (sf) (approximately 15.1 acres).

US2 and the SRA are parties to a Master Land Disposition Agreement dated May 2, 2017 (the "MLDA"), which provides for a process through which US2 will seek to acquire ownership of the D Blocks, or alternatively for the SRA to acquire sites through eminent domain and transfer ownership thereafter to US2 or its affiliates.



Union Square Somerville, Massachusetts

Figure 1-1

Project Locus, Existing Conditions and Proposed GLX Location

Union Square Somerville, Massachusetts

Figure 1-2

Existing Roadway Network and Proposed Lots

The D1 Block is referred to as the "Civic Block" and is bordered by Washington Street to the north, Prospect Street to the west, Somerville Avenue to the south and Merriam Street to the east. D1 has multiple owners and is currently occupied by Ricky's Flower Market, the City of Somerville Public Safety Building, Fred M. Susan & Sons Auto Painting shop and a two-family house.

The D2 Block is also referred to as the "North Prospect Block" and is bordered by Somerville Avenue to the north, Prospect Street to the west, the MBTA Fitchburg Line right-of-way to the south and several privately-owned parcels fronting Allen Street to the east. D2 is entirely owned by the SRA or the City. The site is currently vacant and is being used for construction staging and parking by local contractors working on the City's infrastructure project and GLX. D2 is also immediately adjacent to the future Green Line station (referred to herein as "Union Square Station") being constructed as part of the GLX project; in fact, an approximately 0.36-acre corridor of property on the southern boundary of D2 will be dedicated to a permanent easement for Union Square Station (see Figure 1-3, US-1-PEVE).

The D3 Block is also called the "South Prospect Block" and is bordered by the MBTA Fitchburg Line right-of-way to the north, Prospect Street and Webster Avenue to the west/southwest and Columbia Street/Windsor Place to the south. D3 contains three lots occupied by a vacant warehouse/office (50 Webster Avenue) and Royal Hospitality Services, a commercial laundry facility (56 Webster Avenue and 520 Columbia Street).

The D4 Block is referred to as the "West Prospect Block" and contains three non-contiguous lots with frontage on Prospect Street. D4 is currently occupied by commercial auto lots or uses and a Cross-Fit gym.

The D5 Block is also known as the "Washington Street North Block" and contains two non-contiguous lots with frontage on Washington Street that are currently occupied by a former Union Gulf gas station and the former Monro Muffler auto shop. The two D5 lots straddle either side of Columbus Avenue.

The D6 Block is also known as the "Somerville Avenue South Block" as it is located on the south side of Somerville Avenue and is bordered by Prospect Street to the east, Everett Street to the south, and privately-owned parcels fronting Webster Avenue to the west. D6 is comprised of five separate lots with commercial buildings owned and/or occupied by the following businesses: Angel Nails, Tech Auto Body, Buk Kyung Korean Restaurant, Mandarin Chinese Restaurant, Mike's Automotive, Ebi Sushi and Dunkin Donuts.

The D7 Block is also called the "Warren Block" and contains two non-contiguous lots located on either side of Warren Avenue at Bow Street. One lot is located at the northwest corner of Warren Avenue and Bow Street and is currently occupied by the Goodyear Auto Service Center. The second lot is a through-lot fronting Warren Avenue to the northwest and Stone Avenue to the southeast and is currently occupied by Citizens Bank and a parking lot.

PARCEL NO.	PURPORTED OWNER	TYPE OF ACQUISITION	ADDRESS	REGISTRY OF DEEDS BK.	REGISTRY OF DEEDS PG.	CITY OF SOMERVILLE MAP	CITY OF SOMERVILLE BLOCK	CITY OF SOMERVILLE LOT	AREA IN SQ. FT.	COUNTY
US-732-1	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	FEE ACQUISITION	35 CHARLESTOWN ST SOMERVILLE	65384	74	95	D	1	52,826	MIDDLESEX
US-1-TE-1	SOMERVILLE REDEVELOPMENT AUTHORITY	TEMPORARY EASEMENT	PROSPECT STREET SOMERVILLE	61890	47	82	D	26,27 &28	23,784	MIDDLESEX
US-1-TE-2	OWNER UNKNOWN (BENNETT STREET)	TEMPORARY EASEMENT	PROSPECT/BENNETT STREET SOMERVILLE	–	–	–	–	–	1,000	MIDDLESEX

PARCEL NO.	PURPORTED OWNER	TYPE OF ACQUISITION	ADDRESS	REGISTRY OF DEEDS BK.	REGISTRY OF DEEDS PG.	CITY OF SOMERVILLE MAP	CITY OF SOMERVILLE BLOCK	CITY OF SOMERVILLE LOT	AREA IN SQ. FT.	VOLUME IN CUBIC. FT.	COUNTY
US-1-PEVE	SOMERVILLE REDEVELOPMENT AUTHORITY	PERMANENT EXCLUSIVE VOLUMETRIC EASEMENT	PROSPECT STREET SOMERVILLE	61890	47	82	D	24,23, 25,20, 21,&38	16,288	2,031,928	MIDDLESEX

MB 12 US 7-2 VM 901 PARCEL NUMBER

HATCH LEGEND:

- MBTA OWNED PROPERTY
- PERMANENT EASEMENT
- TEMPORARY EASEMENT

NOTES:

1. SEE SHEET 000-R-2001 FOR LEGEND AND NOTES.
2. REFER TO EXHIBIT 2F FOR ACCESS AND LAYDOWN

0 20 40 80 160

1" = 40'

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
GREEN LINE EXTENSION PROJECT
DESIGN BUILD – MBTA CONTRACT NO. E22CN07
MIDDLESEX COUNTY
CAMBRIDGE/SOMERVILLE/MEDFORD, MASSACHUSETTS

RIGHT OF WAY EXHIBIT PLAN
NEW HAMPSHIRE MAINLINE (LOWELL LINE) &
FITCHBURG LINE
MEDFORD, SOMERVILLE & CAMBRIDGE, MA

GLX massDOT Massachusetts Department of Transportation

BRYANT ASSOCIATES

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.
1	07/28/17	FINAL RFP – ADDENDUM 6	KNK	TMC	CAV
0	05/23/17	FINAL RFP SUBMISSION	KNK	TMC	CAV

SCALE: 1" = 40' DATE: MAY 23, 2017 DRAWN BY KNK DESIGN BY TMC CHECK BY CAV PLAN NO. SHEET: 000-R-2029 ISSUE 1

Craig Vancour 7-28-17

Union Square Somerville, Massachusetts

Figure 1-3

Preliminary Exhibits of MBTA Easements

1.2.3 *Project Description and Phasing*

The plan for the revitalization of Union Square aims to fulfill the multitude of goals of both the Union Square community and the greater City of Somerville identified through decades of thoughtful research and planning. Utilizing the commitments set forth in the City's first comprehensive plan, *SomerVision*, together with the plans for implementation identified in the Union Square Neighborhood Plan (Neighborhood Plan), the Project maintains as its foundation the unique values of the community that have informed this process from the beginning. These same values, for diversity, strength of community, sustainability, innovation, and a resilient economy have informed the Union Square zoning overlay, setting the framework for the transformative development that will establish Union Square as a new regional employment center while ensuring Union Square also remains a place for everyone.

The Project will redevelop Union Square into the transit-oriented, 18-hour, mixed-use urban employment center envisioned in *SomerVision*. At completion, the Project will include approximately 2,360,000 sf of new spaces in which to live, work, play and raise a family. Approximately 1,430,000 sf will be commercial spaces that is expected to generate over 5,300 permanent jobs and significant new commercial taxes. Table 1-1 includes details of the Project Program.

Table 1-1 Project Program[1]

Lot	Office/Lab (sf)	Retail (sf)	Hotel (sf)	Arts/Creative (sf)	Residential (sf)	Residential units	Parking spaces
D1.1	-	11,000	93,000[2]	-	-	-	50
D1.2	231,000	11,000	-	6,000	-	-	385
D2.1	166,000	12,000	-	-	-	-	-
D2.2-3	-	17,000	-	13,000	399,000	450	270
D2.4	-	-	-	12,000	-	-	-
D3.1	271,000	9,000	-	-	-	-	270
D3.2	-	9,000	-	9,000	333,000	376	-
D3.3	251,000	-	-	6,000	-	-	320
D4.1	25,000	5,000	-	-	-	-	-
D4.2	-	-	-	-	-	-	-
D4.3	-	7,000	-	-	54,000	48	25
D5.2	21,000	4,000	-	-	-	-	-
D5.3	-	3,000	-	-	30,000	25	15
D6.1	96,000	12,000	-	4,000	-	-	55
D6.2	97,000	14,000	-	4,000	-	-	55
D7.1	-	5,000	-	-	40,000	34	20
D7.2	-	4,000	-	-	77,000	65	30
Total	***1,158,000***	***123,000***	***93,000[2]***	***54,000***	***933,000***	***998***	***1,495***

[1] All numbers are approximate.
[2] Includes approximately 175 rooms.

These work spaces will serve lab, office, retail, arts & creative enterprise (ACE) and hotel uses that will establish Union Square as an employment center and offer a range of opportunities to local residents. Economic research suggests that innovation job growth will stimulate job opportunities throughout the local economy.

As the neighborhood evolves, new residential units will be important to maintaining a vibrant environment, serving new workers and contributing to housing attainability for a range of residents and families. The Project proposes a total of approximately 933,000 sf of residential uses, or approximately 998 new homes, which will include approximately 200 permanently affordable homes.

Approximately 160,600 sf of new open space, including approximately 113,600 sf of new high-quality civic open spaces will be created as part of the development. A network of 11 civic open spaces will include an approximately 27,000 sf neighborhood park, a significant plaza that connects the new Union Square Station to the neighborhood, and a collection of other diverse and interesting civic open space types that can serve a wide range of community needs.

Significant transit, infrastructure and public realm improvements will make Union Square a more complete neighborhood in which to live and work. The new Union Square Station will provide transit connectivity throughout the Boston metro area, including with other employment centers and areas of interest (e.g., North Station, Government Center, Copley Place, Fenway and Longwood Medical and Academic Area). Updated public utility infrastructure constructed by the City will improve service, mitigate flooding and create the capacity for new land uses. Public rights-of-way in Union Square will be significantly enhanced. Improvements will prioritize the pedestrian and cyclist over the vehicle, and will endeavor to implement the exciting "Complete Streets" streetscape vision included in the Neighborhood Plan. Appendix A1 includes drainage, sewer and water system plans.

The Project will deliver economic benefits that will enable the City to better serve its residents and continue to grow as one of the most desirable places to live and work in the metro area. The Project will deliver more than $475 million in revenue over the next 30 years in the form of permit fees, property taxes and land sale proceeds. Commercial taxes will outpace residential taxes by a ratio of 3:1, contributing to *SomerVision*'s goal to reduce fiscal dependence on state aid and residential taxes.

Public and community benefits have been a priority since planning started in Union Square, and the Project includes a robust public and community benefits program which is valued at approximately $100 million, and aims to address a range of community priorities (e.g., affordable housing, local jobs and workforce development, local business support, open space and sustainability, mobility and infrastructure). This includes approximately $36.3 million of US2 cash contributions to fund identified areas of neighborhood need, including the GLX, offsite infrastructure improvements, job linkage, housing linkage, inflow and infiltration improvements, future phase mitigation and additional areas of community benefit need as identified and prioritized by the community.

Lastly, US2 has committed to negotiating a community benefits agreement with the Union Square Neighborhood Council to address other means of collaboration to meet community objectives. Since the filing of the ENF, US2 has been meeting regularly with the negotiating committee of the Union Square Neighborhood Council (including over 25 meetings) to work towards a community benefits agreement. Benefits discussions have included ideas focused on housing affordability; workforce; sustainability; small and sustainable business; green and open space; arts and creative economy; parking and traffic and indoor civic space. Some of the specific community benefits that were requested by the Union Square Neighborhood Council as part of the ongoing negotiation and that mitigate Project environmental impacts have been added to the Section 61 Findings in this FEIR.

The Project is described by Phase and Block below.

1.2.3.1 Anticipated Project Phases

As requested in the DEIR Certificate, the following section provides a detailed description of the anticipated Project phasing, identified as Phase 1, Phase 2, Phase 3 – South and Phase 3 - North. The Project is anticipated to be completed in approximately 10 to 15 years depending on market conditions and other factors. Project phasing and the sequence of individual building development will respond to market demands for the different program uses proposed within the mixed-use Project, and to other factors. While flexibility of Project sequencing is critical to the Project's ability to respond to market conditions, as demonstrated herein, Project benefits and mitigation measures are largely anticipated to be delivered proportionally as individual buildings are added to the neighborhood.

The building program, infrastructure, environmental impacts, and mitigation and public benefits for each phase are detailed in tabular format in Table 1-2, with additional details by Lot in Appendix B. The section below provides a narrative describing each phase. Each phase is also illustrated on a site plan (see Figures 1-4 to 1-7). As the Project is developed, the Lots included in each phase may be adjusted in the future in order to respond to market conditions, to provide a better construction sequence and/or to comport to the sequence of property acquisition. Additional details regarding the City's Streetscape and Infrastructure Improvements that complement the Project are provided in Section 1.4.

All values included in this section are approximate and are subject to refinement based on final approvals through the City's DSPR process as individual buildings and open spaces are developed.

Table 1-2 Proposed Project Phasing

	PROJECT TOTALS	PHASE 1	PHASE 2	PHASE 3 - SOUTH	PHASE 3 - NORTH
Building Program					
Total SF (excluding parking)	**2,361,000**	**607,000**	**384,000**	**699,000**	**671,000**
Office/Lab (SF)	**1,158,000**	166,000	271,000	276,000	445,000
Arts/Creative (SF)	**54,000**	13,000	-	15,000	26,000
Retail (SF)	**123,000**	29,000	20,000	21,000	53,000
Hotel (SF)	**93,000**	-	93,000	-	-
Residential (SF)	**933,000**	399,000	-	387,000	147,000
Parking Spaces	**1,495**	270	320	345	560
Environmental Impacts					
Vehicle Trips (Adjusted)	**9,398**	2,035	2,043	2,317	3,003
Water Usage (gpd)	**140,485**	44,563	20,288	46,419	29,220
Wastewater Generation (gpd)	**140,485**	44,563	20,288	46,419	29,220
Air Quality	Compared to the Existing Condition, it is predicted that nitrous oxides (NOx) and volatile organic compounds (VOCs) from Project-related vehicle trips will result in a small increase of 0.4 tons per year of VOCs and a decrease of 2.8 tons per year of NOx. Air quality impacts related to vehicle trips would be mitigated through the Project's Mobility Management Plan that will be adjusted as necessary based on the Project's monitoring program and terms of the Mobility Management Plan.				
GHG Emissions	14%	13.5%	14.9%	14.4%	14%
	Phase 3 – South will include the construction of one building consistent with Passive House design (D4.3).				
	GHG emissions related to transportation would be similar to the air quality impacts. The Project will include parking designated for fuel efficient and electric vehicles.				
Cultural Resources	The existing buildings on the Project site will be removed. Some of the buildings proposed for removal are later mid-20th century and/or altered buildings. Seven buildings included in the Inventory of Historic and Archaeological Assets of the Commonwealth located within the Project site are no longer extant. No building is listed or determined eligible for listing on the National Register. The extant buildings proposed for removal have all suffered from a variety of alterations including replacement cladding, replacement windows and doors, as well as large additions. Historic and architectural integrity has been fully or partially compromised on all buildings proposed for removal. The Massachusetts Historical Commission has determined that the Project will have 'no adverse effect'.				
Hazardous Waste	Environmental due diligence will be performed prior to proposed redevelopment of each Lot to assess current soil and groundwater conditions as they relate to the development concept. Hazardous site conditions will be remediated consistent with federal, state and local regulations.				

Table 1-2 Proposed Project Phasing (Continued)

	PROJECT TOTALS	PHASE 1	PHASE 2	PHASE 3 - SOUTH	PHASE 3 - NORTH
Mitigation & Public Benefits (additional mitigation details by phase, including items not easily quantified, provided in Chapter 5)					
Jobs Creation & Workforce Development					
Construction Jobs	**4,272**	1,083	801	1,182	1,206
Permanent Jobs	**5,186**	500	732	1,497	2,458
Arts & Creative Spaces (SF)	**54,000**	13,000	-	15,000	26,000
Job Linkage	**$2,821,636**	$227,965	$872,466	$639,553	$1,081,652
Housing					
Housing Units	**998**	450	-	424	124
Affordable Units (20% of total)	**200**	90	-	85	25
Housing Linkage	**$10,843,050**	$1,480,140	$3,246,610	$2,273,740	$3,842,560
City Fiscal Benefits					
Linkage (as itemized above)	**$13,664,686**	$1,708,105	$4,119,076	$2,913,293	$4,924,212
Permits & Fees	**$17,816,850**	$4,518,332	$3,339,049	$4,932,240	$5,027,229
SRA Land Cost Recovery	**$22,000,000**	$22,000,000	-	-	-
Sub-total 'one time' City Fiscal Benefits	***$53,481,537***	*$28,226,437*	*$7,458,126*	*$7,845,533*	*$9,951,441*
Annual Taxes ($/year)	**$11,141,879**	$2,387,025	$2,598,287	$2,889,434	$3,267,133
Commercial Taxes ($/year)	**$8,440,812**	$1,169,109	$2,598,287	$1,741,887	$2,931,529
Transportation & Mobility					
Neighborhood Mobility Management					
GLX Contribution to City[1,4]	**$5,836,392**	$1,500,504	$949,248	$1,727,928	$1,658,712
Offsite Infrastructure Contribution, includes planned Complete Streets improvements[1,4]	**$4,627,560**	$1,189,720	$752,640	$1,370,040	$1,315,160
Transportation Mitigation Funds from Future Phase Mitigation Contribution[2,4]	*a portion of or all of Future Phase Mitigation Contribution below (at City discretion, see Other Benefits below for Future Phase Contribution amount)*				
Rapid Response Transportation Mitigation Funds[3,4]	**$411,500**	$60,700	$76,800	$139,800	$134,200
Sub-total Transportation & Mobility Contributions	***$10,875,452***	*$2,750,924*	*$1,778,688*	*$3,237,768*	*$3,108,072*
Transportation Demand Management & Reporting	**17**	2	2	5	8
Shared Parking Construction & Management (spaces)	**1,405**	270	320	320	495
Hotel Shuttle	**1**	-	1	-	-
Mid-Block Thoroughfares (LF)	**1,885**	1,125	395	365	-
Transit Riders					
Improved Bus Stops on Project Frontages	**6**	1	1	1	3
Permanent Easement for MBTA Station (SF)	**16,288**	16,288	-	-	-

Table 1-2 Proposed Project Phasing (Continued)

	PROJECT TOTALS	PHASE 1	PHASE 2	PHASE 3 - SOUTH	PHASE 3 - NORTH
Mitigation & Public Benefits (additional mitigation details by phase, including items not easily quantified, provided in Chapter 5)					
Transportation & Mobility (continued)					
ADA Path MBTA to Prospect St. Sidewalk (LF)	**350**	350	-	-	-
D2 Improvements for MBTA Station and Access	**$1,500,000**	$1,500,000	-	-	-
Pedestrians					
Expanded Sidewalks on 'Pedestrian Streets' (LF)	**2,541**	350	560	470	1,161
Cyclists					
Short term & Long term Bike Parking	**1,603**	563	104	590	346
MBTA Bicycle Parking	**120**	120	-	-	-
Bike Share Stations & Bikes	**2**	-	1	1	-
Utility Infrastructure					
Offsite Infrastructure Contribution - includes Utilities[1,4]	*a portion of Offsite Infrastructure Contribution noted above in Transportation will contribute to planned utility improvements*				
I/I Contribution	**$4,472,081**	$1,359,245	$769,130	$1,332,195	$1,011,512
Sub-total Utility Contributions	***$4,472,081***	*$1,359,245*	*$769,130*	*$1,332,195*	*$1,011,512*
Private Investment Unlocking $16M MassWorks Grant	**$325,000,000**	$325,000,000			
Sustainable Design & Climate Change Preparedness					
Open Space & Public Realm					
Civic Open Space (SF)	**113,600**	20,100	16,000	27,800	49,700
Pervious Civic Open Space (minimum SF)	**79,520**	14,070	11,200	19,460	34,790
Buildings					
LEED Gold Certifiable Building Area (SF)	**2,216,000**	607,000	384,000	669,000	556,000
LEED Silver Certifiable Building Area (SF)	**145,000**	-	-	30,000	115,000
Passive House Multi-Family Building (SF)	**54,000**	-	-	54,000	-
PV Set Aside on Roof (SF)	**40,000**	10,000	5,000	10,000	15,000
PV - Potential Additional Set Aside on Roof (SF)	**49,100**	-	14,800	17,700	16,600
Green Vehicle Infrastructure in Commercial Parking Facilities					
Parking Spaces with EV Charging	**38**	10	10	6	12
Parking Spaces to be EV-Ready	**38**	10	10	6	12
Parking Spaces Reserved for LEV/FEV Vehicles	**72**	14	17	16	25

Table 1-2 Proposed Project Phasing (Continued)

	PROJECT TOTALS	PHASE 1	PHASE 2	PHASE 3 - SOUTH	PHASE 3 - NORTH
Mitigation & Public Benefits (additional mitigation details by phase, including items not easily quantified, provided in Chapter 5)					
Sustainable Design & Climate Change Preparedness (continued)					
Parking Spaces Reserved for Carshare	**14**	2	4	2	6
Parking Spaces Reserved for Carpool per Zoning	**29**	5	8	5	11
Total Green Spaces	**191**	41	49	35	66
Other Benefits					
Community Benefits Contribution[4]	**$3,890,928**	$1,000,336	$632,832	$1,151,952	$1,105,808
Future Phase Mitigation Contribution, including Transportation Mitigation[4]	**$3,437,840**	-	$752,640	$1,370,040	$1,315,160
Sub-total Other Public Benefits Contributions	***$7,328,768***	*$1,000,336*	*$1,385,472*	*$2,521,992*	*$2,420,968*

1 The Offsite Infrastructure Contribution will be utilized by the City to fund planned infrastructure improvements with the neighborhood that will include both Complete Streets and Utilities. The total value of this contribution is shown under transportation and referenced under utilities so it is not double counted.

2 The Future Phase Mitigation Contribution will be utilized at the City's discretion to address future transit, transportation infrastructure or community needs. The City anticipates using a portion or all of these funds for future transportation mitigation. The total value of this contribution is shown under other benefits and referenced under transportation so it is not double counted.

3 The Rapid Response Transportation Mitigation Fund is $0.10 psf of the future phase contribution and $0.10 psf of the offsite infrastructure contribution as designated by the City.

4 These mitigation contributions will be paid in accordance with the Development Covenant by and between US2 and the City of Somerville. 50% of the contribution amount is payable at the issuance of the building permit for the given Lot and 50% is payable at certificate of occupancy for the given Lot. In addition, the required contribution amount escalates at the Consumer Price Index on an annual basis.

PROGRAM DATA

Building Program	Phase 1 Added SF	Phase 1 Added %	Cumulative Total SF	Cumulative Total %
Office/Lab	179,000	29%	179,000	29%
Retail	29,000	5%	29,000	5%
Hotel	-	0%	-	0%
Residential	399,000	66%	399,000	66%
Parking Spaces	270		270	
Total (excluding parking)	607,000	100%	607,000	100%
% Commercial		34%	-	34%

Union Square **Somerville, Massachusetts**

USQ

Figure 1-4

Phase 1 Key Plan

PROGRAM DATA

Building Program	Phase 2 Added SF	Phase 2 Added %	Cumulative Total SF	Cumulative Total %
Office/Lab	271,000	71%	**450,000**	45%
Retail	20,000	5%	**49,000**	5%
Hotel	93,000	24%	**93,000**	9%
Residential	-	0%	**399,000**	40%
Parking Spaces	320		**590**	
Total (excluding parking)	384,000	100%	**991,000**	100%
% Commercial		100%	-	60%

Union Square Somerville, Massachusetts

Figure 1-5

Phase 2 Key Plan

PROGRAM DATA

Building Program	Phase 3S Added SF	%	Cumulative Total SF	%
Office/Lab	291,000	42%	741,000	44%
Retail	21,000	3%	70,000	4%
Hotel	-	0%	93,000	6%
Residential	387,000	55%	786,000	47%
Parking Spaces	345		935	
Total (excluding parking)	699,000	100%	1,690,000	100%
% Commercial		45%	-	53%

Union Square Somerville, Massachusetts

Figure 1-6

Phase 3 - South Key Plan

PROGRAM DATA

Building Program	Phase 3N Added SF	%	Cumulative Total SF	%
Office/Lab	471,000	70%	1,212,000	51%
Retail	53,000	8%	123,000	5%
Hotel	-	0%	93,000	4%
Residential	147,000	22%	933,000	40%
Parking Spaces	560		1,495	
Total (excluding parking)	671,000	100%	2,361,000	100%
% Commercial		78%	-	60%

Union Square **Somerville, Massachusetts**

USQ

Figure 1-7

Phase 3 - North Key Plan

Phase 1 (D2.1, D2.2/D2.3)

Phase 1, as shown on Figure 1-4, will mark the beginning of the transformation of Union Square into an urban employment center. This phase recognizes the current and future heart of the neighborhood, Union Square Plaza, as foundational – and works to bridge access to it from the new community node that will be Union Square Station.

D2 is anticipated to start construction in the third quarter of 2019, with first building being completed in late-2021, proximate to Union Square Station's opening.

D2.1 is proposed to be developed as a seven-story commercial building, with approximately 12,000 sf of ground floor retail fronting Somerville Avenue. The height of the building including the potential mechanical penthouse is planned to be comparable to the height of the commercial buildings that are planned for Lots D1.2 and D3.1. D2.2 and D2.3 are proposed to be developed as residential buildings with approximately 17,000 sf of ground floor retail fronting a new approximately 20,100 sf civic open space along Prospect Street. D2.2 is planned to be five stories separated by a hypothetical lot line from D2.3, which will be developed as a 25-story tower. Due to the rising grade of Prospect Street as it crosses the train tracks, the height of the D2.2 building and the podium of D2.3 are proposed to be approximately equal to the height of D6.1.

The planned 25-story tower on D2.3 will provide an iconic landmark near Union Square Station, and will be approximately equal in height to the tower planned for Lot D3.2. In total, D2.2 and D2.3 are planned to operate as one residential building and will include approximately 450 residential units. A shared parking garage is also proposed to be included on these Lots.

Approximately 13,000 sf of ACE space is proposed to be provided across D2.1, D2.2 and D2.3.

Phase 1 will add significant new civic open space to the neighborhood (approximately 20,100 sf). A high-quality at-grade civic open space will provide access to and from the Union Square Station platform, and a separate new open space will be created adjacent to Union Square Station (see Section 1.2.4.3 for additional information). Infrastructure improvements during this phase include the addition of several roadways internal to D2 (including The Ride drop-off), new pedestrian and bike ways, additional bicycle parking and stormwater management infrastructure.

As requested in the DEIR Certificate, the following plans have been included to provide additional details regarding the D2 design:

- Figure 1-8: D2 Site Plan
- Figure 1-9: D2 Site Circulation
- Figure 1-10: D2 Civic Open Space B Features
- Figure 4-1: D2 Stormwater Management
- Appendix A2: D2.1 and D2.2-2.3 Building Elevations

Access to Union Square Station will be coordinated and completed during the first phase of development. The MBTA GLX team has indicated that it expects to deliver Union Square Station approximately simultaneously with the development of Phase 1. US2 has been coordinating with the MBTA, the City and the GLX project team to ensure that both projects can proceed in concert and deliver an integrated environment (see Section 1.3 for additional information regarding ongoing GLX coordination). Since D2 is the only development by US2 with direct access to Union Square Station, future development phases will not impede access to the station entry.

Phase 2 (D1.1, D3.1)

Phase 2, as shown on Figure 1-5, is focused on further construction along Prospect Street of the activated street wall started in Phase 1 in order to further define the strong connection between the new Union Square Station and the existing Union Square Plaza.

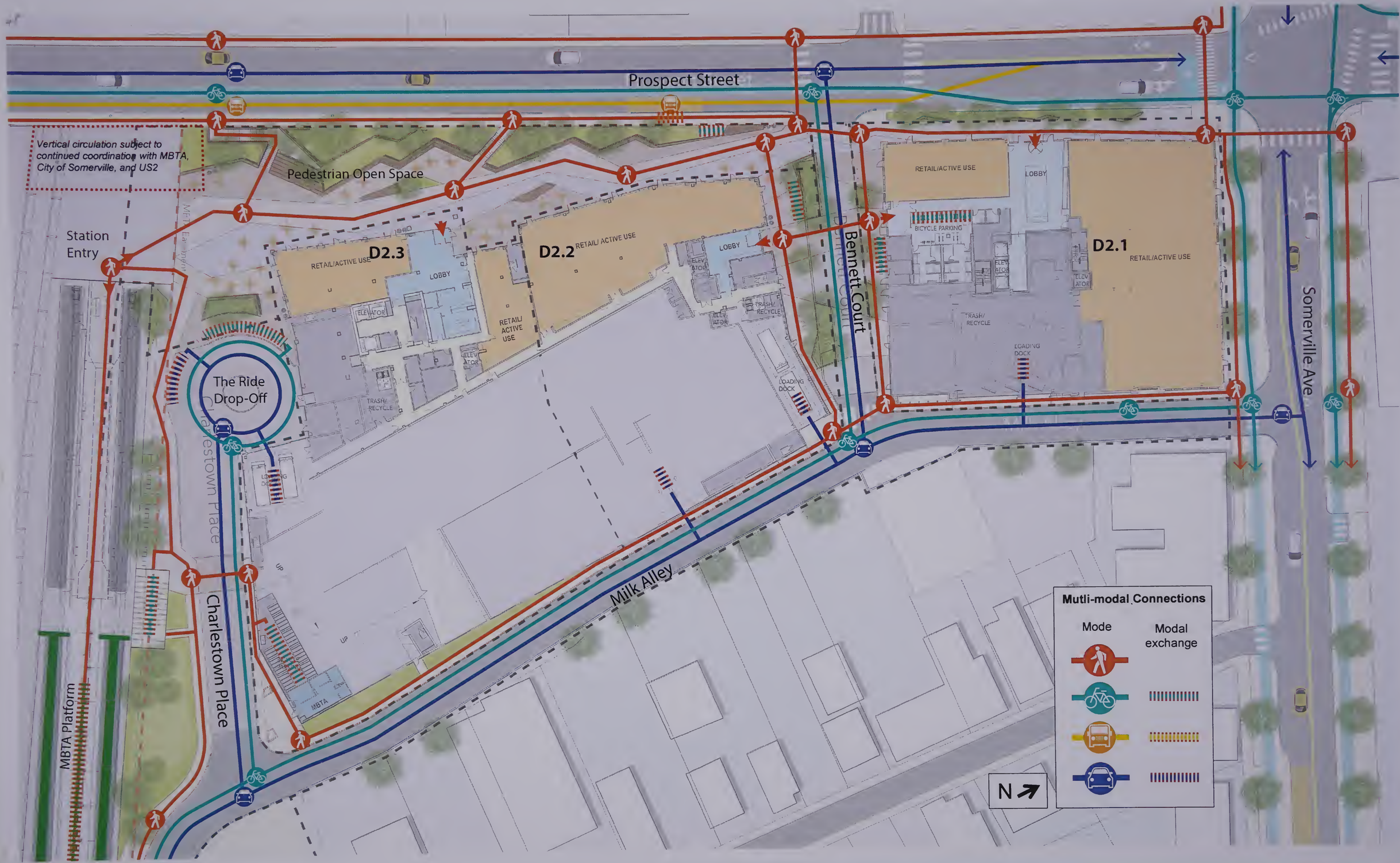
Across Somerville Avenue, facing Phase 1's commercial building, the D1.1 site will be transformed into an approximately 175-room, five-story hotel, a use that will serve as a significant amenity to Union Square's increasingly commercial user base and will be a significant commercial tax producer. The building is planned to be approximately equal in height to the buildings on D6.1 and D6.2, providing a consistent datum on the south and east sides of Union Square Plaza. The ground floor is proposed to include approximately 11,000 sf of retail space, and approximately 50 parking spaces will be located below-grade.

South of Union Square Station, D3.1 will be developed into a 10-story commercial office or lab building of approximately 280,000 sf and approximately 9,000 sf of ground floor retail. The height of this planned building will be consistent with the height of the commercial building on D1.2, and approximately the same height as the commercial building on D2.1 when the mechanical penthouse is included. D3.1 will include a podium with approximately 270 structured parking spaces.

Phase 2 will add significant new civic open space on D3.1 (approximately 16,000 sf) that will provide the gateway from the neighborhood south of the railroad tracks into the heart of Union Square. Infrastructure improvements during this phase include the addition of roadways internal to D1 and D3 that improve neighborhood permeability, new pedestrian paths, additional bicycle parking and stormwater management infrastructure.

Union Square Somerville, Massachusetts

Figure 1-8
D2 Site Plan



Union Square Somerville, Massachusetts

Figure 1-9

D2 Site Circulation

- Diverse seating types host users of all abilities across multiple and varied activity zones

Working / Waiting

Watching / Entertaining

Sharing / Reflecting

Gathering / Relaxing

Dining / Meeting

Vertical circulation subject to continued coordination with MBTA, City of Somerville, and US2

- 521 CMR compliant walkway within accessible pedestrian plaza. Running slope less than 5%, cross slope less than 2% throughout

- Point of entry demonstrably linked to Union Square's historic landmarks through choreographed vistas

~14,070 SF

Of new permeable surface

~13,000 SF

of new urban tree canopy

Figure 1-10

D2 Civic Open Space B Features

Phase 3 - South (D3.2, D3.3, D4.1, D4.2, D4.3)

Phase 3 – South, as shown on Figure 1-6, is composed of building sites located primarily south of the railroad tracks. Development of these building sites will establish a gateway for the southern edge of the neighborhood and create a stronger connection between the core of Union Square and the Boynton Yards area to the south. Boynton Yards is currently lower density industrial, warehouse and automotive uses. However, the Neighborhood Plan envisions the expansion of Union Square's mixed-use employment center into Boynton Yards over time.

D3.2 is proposed to be developed as a 24-story residential building, with approximately 9,000 sf of ground floor retail fronting Webster Avenue, approximately 9,000 sf of ACE space and residential uses above. Approximately 376 residential units are proposed. The height of the planned building is consistent with the tower on D2.3.

D3.3 is proposed to be developed as a 10-story commercial office or lab building of approximately 280,000 sf with approximately 6,000 sf of ACE space. The height of the planned building will be consistent with the height of the commercial building on D1.2, and approximately the same height as the commercial building on D2.1 when the mechanical penthouse is included. D3.3 will include a podium of approximately 300 structured parking spaces.

To complement the larger-scale uses on D3, D4.1 is proposed to be a four-story commercial building of approximately 30,000 sf, with approximately 5,000 sf of retail space located along Prospect Street. The height of the building is proposed to relate to the scale of the podium base of D2.2 (five stories) and the south side of D6.1, and will provide for a transition from the D2 density to the residential scale to the west and southwest.

On the south side of the tracks, D4.2 will be improved exclusively as civic open space.

D4.3 is proposed to be a four-story residential building containing approximately 48 residential units on the upper floors, with approximately 7,000 sf of ground floor retail facing Webster Avenue. The height of the planned building will relate in scale to the residential neighborhood along Webster Avenue and the podium base of D3.2, and will provide for a transition in scale from the D3 density to the residential scale to the south and southwest.

Phase 3 - South will add new public open space to the overall civic open space network as follows: D3.2 will provide an approximately 8,200 sf of civic open space; D3.3 will add approximately 3,700 sf of civic open space; D4.1 will create approximately 3,400 sf of new civic open space along an existing pedestrian desire line; D4.2 will be improved into an approximately 6,000 sf civic open space; and D4.3 will preserve an existing community garden (approximately 6,500 sf of civic open space).

Infrastructure improvements during this phase include the addition of internal roadways on D3 that improve neighborhood connectivity and permeability, new pedestrian paths, additional bicycle parking and stormwater management infrastructure. Additionally, portions of Everett Street and Newton Street near D4.1 will be reconfigured to improve traffic patterns and provide for a pedestrian way and civic open space.

Phase 3 - North (D1.2, D2.4, D5.2, D5.3, D6.1, D6.2, D7.1, D7.2)

Phase 3 – North, as shown on Figure 1-7, includes several infill building sites that are clustered around Union Square Plaza, in the core of the neighborhood. Development of these sites furthers the goal of returning Union Square to the vital, mixed-use 'downtown' of Somerville.

D1.2 is proposed to be a 10-story commercial building with approximately 11,000 sf of retail and approximately 6,000 sf of ACE space wrapping a parking garage, with frontage on Washington Street, Somerville Avenue, a new alley between D1.1 and D1.2, and a new approximately 27,000 sf neighborhood park (civic open space). Above the fourth floor, the building is planned to be set back 10 feet from the Somerville Avenue and Washington Street facades, and approximately 40 feet from the facade that fronts the new civic open space, creating a four-plus-story plinth which will wrap three sides of the building. The four-story base of the building is intended to relate to the scale of the single-family homes that line Merriam Street, and the commercial and new residential buildings on Washington Street and Somerville Avenue. The neighborhood civic open space will provide a green buffer and scale transition from the Merriam Street homes to the four-story commercial and parking podium, and then to the 10-story commercial building on D1.2. The parking podium will accommodate approximately 385 parking spaces.

D2.4 is proposed to be developed as an approximately 12,000 sf building dedicated to ACE space. The east side of D2.4 is planned to include an approximately 7,100 sf civic open space.

D5.2 is proposed to be a four-story building with approximately 21,000 sf of commercial uses and approximately 4,000 sf of ground floor retail. The height of the building is expected to be approximately equal to the height of the four-story base of D2.2 and the new residential buildings that have been developed on Washington Street.

D5.3 is proposed to be a four-story building with approximately 25 residential units, approximately 3,000 sf of ground floor retail, and approximately 15 parking spaces. The height of the building is expected to be approximately equal to the height of D5.2, the four-story base of D2.2 and the new residential buildings that have been developed on Washington Street.

D6.1 and D6.2 are proposed to be five-story commercial buildings, with ground floor retail space as well as ACE uses totaling approximately 112,000 sf and approximately 115,000 sf, respectively. The height of the buildings is proposed to be approximately the same height as the hotel that is planned for D1.1. The massing of the planned D6.1 building reduces to three stories on the south

side of the building to provide a better scale relationship to the residential buildings that front Everett Street. Approximately 110 parking spaces are anticipated to be constructed in a below-grade parking garage.

D7.1 and D7.2 are proposed to be residential buildings containing approximately 99 residential units with ground floor retail space fronting Bow Street. D7.1 is planned to be a four-story building, approximately the same height as the commercial building across the street and close to the height of the eave of the former church adjacent to Block 11 café, with approximately 20 parking spaces. D7.2 is proposed to step up to five stories, relating to the height of the three-story commercial building on Somerville Avenue, the 11-story Somerville Housing Authority building to the north and the proposed commercial buildings that are planned for D6, and will include approximately 30 parking spaces.

Phase 3 - North will add significant new civic open space to the core of the Union Square neighborhood. D1 will include the largest individual civic open space in the plan, an approximately 27,000 sf neighborhood park. US2 has committed to starting construction on this park no later than when 50% of the overall development square footage has started construction. This effectively 'front-loads' the provision of civic open space for the Project. An approximately 7,100 sf civic open space will be created adjacent to the mid-rise commercial building on D2.4. D6 will include the provision of a new 'through block passage' civic open space of approximately 9,100 sf that honors community pedestrian desire lines. Lastly, D7.1 will add approximately 6,500 sf of civic open space.

Infrastructure improvements during this phase include the addition of new pedestrian paths, additional bicycle parking and new stormwater management infrastructure.

1.2.4 Open Space

1.2.4.1 Introduction

The Project's approximately 160,600 sf of proposed new civic open spaces and public realm improvements will provide existing as well as new residents, workers and visitors with approximately 3.6 acres of new open space to enjoy (see Figure 1-11). The addition of much-needed new green space will enhance connectivity and address a multitude of community desires to play, sit, rest, read, exercise, gather, perform, watch, grow, move, and discover, among many others. Central to the overall plan is an approximately 27,000 sf neighborhood park and a new approximately 20,100 sf plaza that creates a point of entry and access to the future Union Square Station. At completion, the network of new open spaces will provide new civic destinations, define quality pedestrian zones along existing streets and add new passages for discovery. Together, the open spaces will contribute to a Union Square that is a more vibrant place to live, work, play and raise a family.

Figure 1-11
Proposed Civic Open Space

The neighborhood planning process confirmed the community's desire for new, publicly accessible open spaces in Union Square, a longstanding goal of *SomerVision,* and a community priority from the outset of the Project. The Neighborhood Plan introduced new area targets for open space. With the adoption of the Union Square Overlay Zoning District, these area targets increased by over 60%, and further set the expectations for the quality of spaces to be provided.

1.2.4.2 Open Space = Civic Open Spaces + Public Realm Improvements

Civic Open Spaces

The Mayor's Office of Strategic Planning & Community Development recently developed a new system for planning and regulating the creation of public open spaces within Somerville, and the Somerville Zoning Ordinance provisions applicable to the Project incorporate this system. To create this system, planners identified the characteristics that make spaces different from one another and then built a typological menu of publicly-accessible open spaces that provide for unique community needs. These special spaces were called 'Civic Spaces', named to reflect the important civic role that public open spaces play in community building (or as described throughout the FEIR, "civic open spaces"). Together, these civic open space types accommodate different needs in different ways, providing a flexible system to not only ensure that high-quality design would govern their delivery, but to also provide a tool to calibrate unique space types to unique locations, remaining responsive to an area's users and specific needs. To do this, each civic open space type has a set of design standards that guide certain qualities and parameters of the type, including the dimensions of the lot, the seating and tables to be provided, the quantity of tree planting and other planted surfaces, as well as the overall percentage of perviousness of the site. Overall, the civic open space requirements reflect the desire for permeable surfaces, substantial planting and significant tree canopy prioritized by the community.

A summary of the nine permissible civic open space types and their design intent are:

- **Neighborhood Park:** Designed for active and passive recreation with features and facilities that support the immediate neighborhood.
- **Pocket Park:** Designed for passive recreation consisting primarily of vegetation and a place to sit outdoors.
- **Green:** Designed for passive recreation with landscape consisting primarily of green space with lawns, planting beds, paths and trees.
- **Plaza:** Designed for passive recreation, civic purposes, and commercial activities, with landscape consisting primarily of hardscape. They are located in areas of high pedestrian activity.
- **Through Block Plaza:** Designed for passive recreation and to provide a pedestrian connection between two thoroughfares on opposite sides of a block. Consisting primarily of paving and a place to sit outdoors.

- **Pocket Plaza:** Designed for passive recreation consisting primarily of paving and a place to sit outdoors.

- **Playground:** Designed primarily as a play area for children. They may be freestanding or incorporated as a subordinate feature of a neighborhood park.

- **Dog Park:** Designed for the active recreation of dogs and their owners. Dog parks may be freestanding or incorporated as a subordinate feature of a neighborhood park.

- **Community Garden:** Designed as individual garden plots available to residents for urban agriculture purposes, including storage facilities for necessary equipment. May be freestanding or a feature of a neighborhood or pocket park.

Public Realm Improvements

Foundational to linking future civic open spaces into a network of accessible public open spaces, public realm improvements govern the 'space between'. The Project, by its design, will increase sidewalk space along all zoning-defined 'Pedestrian Streets' by setting buildings back to allow for sidewalks with a minimum of 12 feet in width. In sum, the Project proposes more than 47,000 sf of these and other public realm improvements, including wider sidewalks, landscaping, benches and other improvements. The complement of street furnishings and landscape elements will serve to buffer the public realm from vehicles on adjacent streets, elevating levels of safety while simultaneously enhancing the pedestrian experience by providing moments of shade and respite along the public way.

The improvements will ensure the streetscape exemplifies a pedestrian prioritized public realm. Pedestrian streets include:

- Somerville Avenue, with frontages of D1, D2, and D6 buildings;

- Prospect Street, with frontages of D2, D3, D4, and D6 buildings;

- Washington Street, with frontages of D1 and D5 buildings;

- Bow Street, with frontages of D7 buildings; and

- Webster Avenue, with frontages of D3 and D4 buildings.

In summation, the public realm improvements along these pedestrian streets, together with the planned civic open spaces, contribute to the Project's vision for open space. To support the long-term utility and success of these planned open spaces, they have been choreographed to enhance pedestrian connections to both existing and future public open spaces within the neighborhood. This connectivity is depicted in Figure 1-12. The siting of these civic open spaces is the direct result of strategic long-term planning, as described below.

Union Square Somerville, Massachusetts

Figure 1-12

Open Space Network

1.2.4.3 Civic Space Study

The combination of civic open spaces and public realm improvements define the Project's plan for approximately 160,600 sf of new, public open space (including public realm improvements), of which approximately 113,600 sf will be new high-quality civic open spaces. The rarity of the opportunity to introduce new green spaces into the neighborhood brought with it the great responsibility to be cognizant of the range of needs for these spaces within the existing geographical context in which they are to be provided. Much more than an area target, an assessment of needs was necessary to inform the distribution of open spaces.

To this end, a Civic Space Study was developed to include an extensive analysis of existing conditions that served to catalogue existing opportunities afforded to those in the vicinity of Union Square (see Figure 1-13). Open space type, size, location, and relative accessibility were further evaluated through a demographic analysis, while level of service to environmental justice populations concurrently highlighted opportunities to better serve the existing population and directly address matters of social equity.

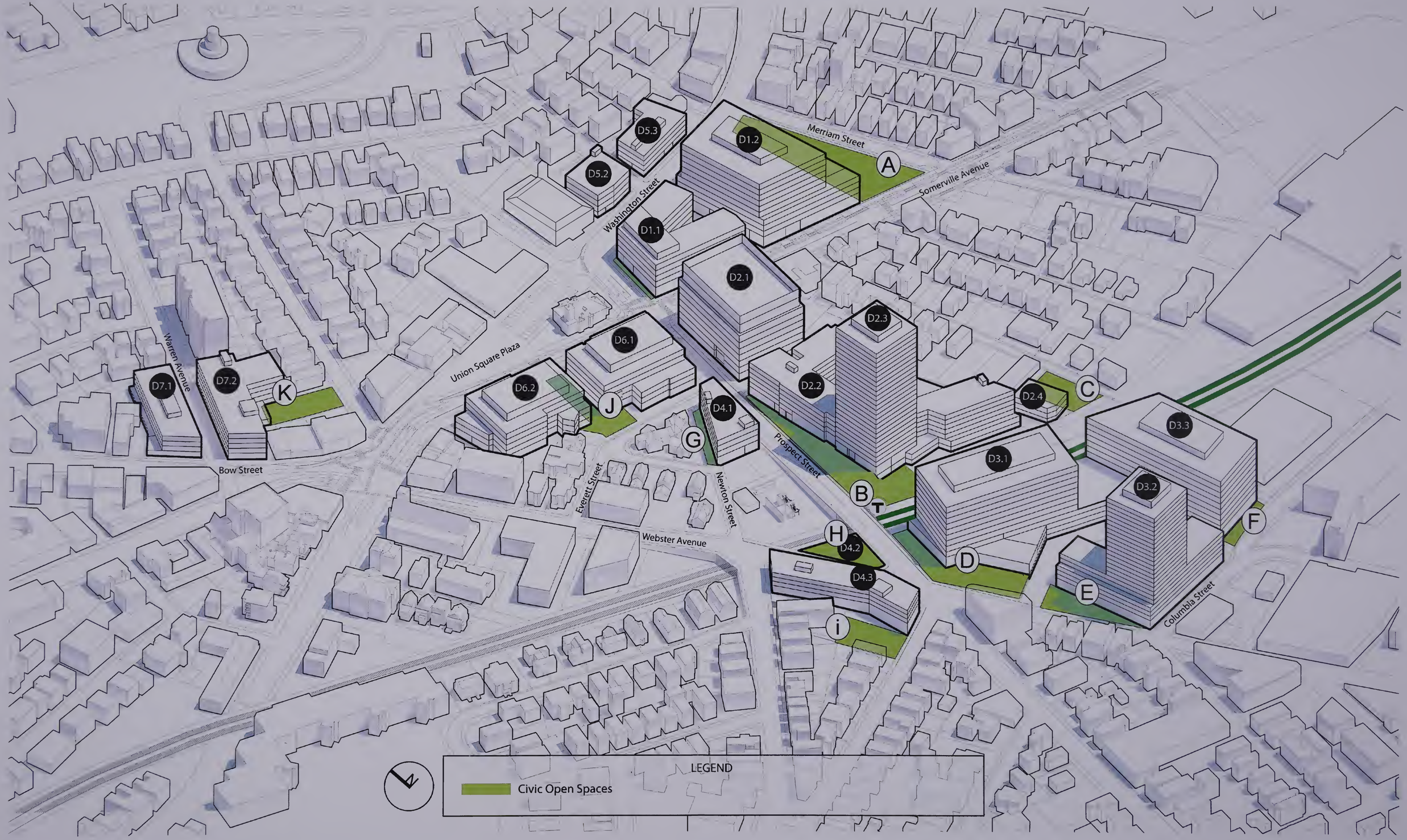
These studies together, paired with feedback from City departments and sustained dialogue with community members throughout the planning process, comprised a needs assessment that informed US2's direction for the master plan of high-quality civic open spaces depicted in Figure 1-14. For more information on the process that resulted in the planned distribution of open spaces, please reference the Civic Space Study which has been included in its entirety as Appendix C.

1.2.4.4 Civic Open Space Plan

The civic open space plan creates a network of diverse civic open spaces that can serve a multitude of users and support a range of different activities as envisioned in the Neighborhood Plan. The collection of civic open spaces will serve existing residents, workers and visitors, as well as new residents, workers and visitors that become part of the Union Square neighborhood as new transit, jobs and homes arrive.

The table below provides an overview of the composition of the approximately 113,600 sf of civic open space to be provided, with Figure 1-15 depicting the corresponding civic open space locations together with expanded detail of the D2 plaza of which more detail is known. Table 1-3 shows details of the proposed civic open spaces.

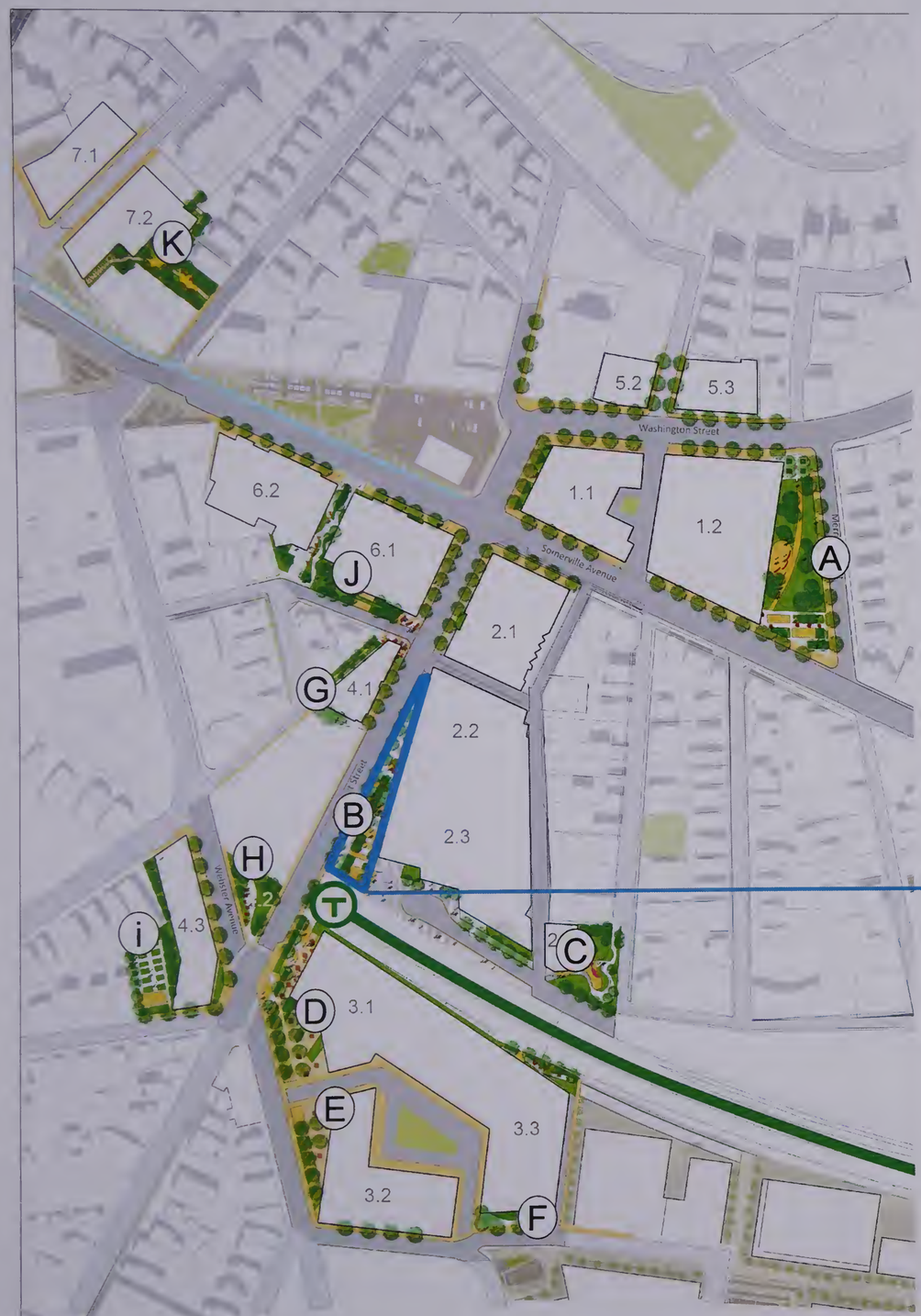
Figure 1-13
Civic Open Space Study Area



Union Square Somerville, Massachusetts

Figure 1-14

Civic Open Space Axonometric Plan



Approved CDSP

D2 Plaza Evolution

Civic Open Space B	Area	Cumulative Area	% over Approved
Approved Area	15,100 SF		
Proposed Area	20,100 SF	20,100 SF	+33%
Additional Green (B1)	2,300 SF	22,400 SF	+48%

Figure 1-15

Civic Open Space Plan with D2 Plaza Evolution

Table 1-3 Civic Open Spaces

Map Ref.	Lot	Approximate Area (sf)	Civic Open Space Type
	D1.1	-	
A	D1.2	27,000	Neighborhood Park
	D2.1	-	
B	D2.2-3	20,100	Plaza
C	D2.4	7,100	2, 3, 6, 7, or 9
D	D3.1	16,000	2, 3, 4, 6, 7, 8, or 9
E	D3.2	8,200	2, 3, 4, 6, 7, or 9
F	D3.3	3,700	2, 6, or 7
G	D4.1	3,400	2, 6, or 7
H	D4.2	6,000	2, 3, 6, 7, or 9
I	D4.3	6,500	2, 3, 6, 7, or 9
	D5.2	-	
	D5.3	-	
	D6.1	-	
J	D6.2	9,100	5
	D7.1	-	
K	D7.2	6,500	2, 3, 6, 7, or 9
	Total	**113,600**	

Civic Open Space Type Key
1. Neighborhood Park
2. Pocket Park
3. Green
4. Plaza
5. Through Block Plaza
6. Pocket Plaza
7. Playground
8. Dog Park
9. Community Garden

Delivered over time, the sum of the Project's unique and site-specific civic open spaces will define a common thread among the Blocks, unifying and complementing the buildings by way of the public spaces between them.

Designs of individual civic open spaces will be further refined through the City's mandated process for permitting and approval of such spaces under zoning. The majority of civic open spaces will receive a 'type' designation for purposes of City zoning during the City's DSPR process for each relevant portion of the Project, with the exception of the plaza that provides the connection between Union Square Station and the Neighborhood Park, for which such designations have been made through the CDSP. To ensure that the civic open spaces are responsive to community needs at the point in time in which they are delivered, the design and programming of each proposed civic open space will occur as the individual Lots are advanced for the DSPR process. Public design meetings will ensure community participation guides the civic open space type designation at the time that designs are advanced.

Civic Open Space Descriptions

D1 | Civic Open Space A | Neighborhood Park

The approximately 27,000 sf Neighborhood Park is envisioned as a multi-use space that can serve the existing and future residents, workers and visitors to Union Square, and will become an important neighborhood destination. Its location on the eastern side of D1.2 addresses an open space gap identified on the eastern side of the neighborhood while remaining central enough to benefit all. The Neighborhood Park will bridge two primary points of entry into Union Square, along Washington Street and Somerville Avenue, both of which are significant pedestrian streets. Entry from Washington Street will constitute the park's narrowest dimension, although still a generous fifty feet in width. Alternatively, the park's southern exposure along Somerville Avenue extends to 140 feet. The park's most prominent and significant frontage will run the length of Merriam Street, a uniquely quiet street considering its location near the center of Union Square, yet only a short walk (0.10 mile) from Union Square Plaza, the neighborhood's existing "living room", responding to community interest in building connections between different types of civic open spaces (see Figure 1-16).

The Neighborhood Park's interface with two prominent streets will increase its visibility and utility. With the arrival of the new Washington Street Station to the north on the Medford Branch of the GLX project, Washington Street will become a significant pedestrian point of entry to Union Square. The park's location on D1.2, centrally located between Union Square Station and Washington Street Station, creates a central civic node linking the many jobs, services, and housing opportunities generated by the Project. Enhanced pedestrian connectivity between north and south will increase pedestrian presence which will have a calming effect on vehicular traffic entering Union Square and elevate both vehicular and pedestrian safety.

The D1 use-mix and density described in the Neighborhood Plan created an ambitious development that considered a five- or six-story structure on the west side of Merriam Street, facing the existing homes. The Neighborhood Park, functioning as an intermediary, reconciles this contextual tension by providing a buffer between the higher densities central and west on the Block, and the residential homes on Merriam Street. The result is a park that will be 'front-facing,' addressing the scale of Merriam Street. Framed by adjacent buildings of three to five stories to the east, west and north, the park will become a new neighborhood "living room".

This thoughtful height transition is facilitated by a mixed-use building that includes a parking podium, which will add an intermittent terrace level to negotiate the change in scales. Fronting a civic open space, per the adopted zoning, the future design of the parking structure will be subject to heightened levels of scrutiny, requiring the articulation of a building that disguises the use within. The need to disguise those uses presents an opportunity to respond to community feedback envisioning art or 'living' green walls to lend to the creation of a stronger sense of place. The location of the garage relative to two pedestrian streets will require the wrapping of the

Figure 1-16
D1 Block - Pedestrian Circulation

garage with active uses on those frontages. Extending these uses around the corners at Washington Street and Somerville Avenue will provide additional means of support to the park, as ground floor cafes or other businesses lend vitality to the space, further encouraging its continued activation.

The Neighborhood Park location is also an opportunity for civic open space to address some of the sustainability and resiliency goals of the City. The Climate Change Vulnerability Assessment (CCVA) identified D1 as a 'priority' area because it is vulnerable to high heat exposure and urban heat island effects. The opportunity to create significant open space and convert impervious area to pervious areas with plantings, green space and permeable hardscape, as well as stormwater management measures, can help mitigate this vulnerability.

The solar orientation of D1 was also evaluated during the planning process. During the summer, the park is exposed to the sun most of the day and experiences more shade later in the evening. In the winter, when the sun appears lower in the sky, the space experiences increased shade. From a resiliency perspective, the shade resulting from the built environment and plantings, required by zoning, mitigate the high heat exposure risk that makes D1 a 'priority' area in the CCVA. During the design and programming of the park, the areas of sun/shade during different periods of the day and year will be further evaluated to create a design that appropriately balances park programming and urban heat mitigation goals.

As was expressed at public meetings, programming of the park is of great interest to the community. The rectilinear shape of the park offers a unique opportunity for multiple programming approaches and the ability to segment the space into different zones. This potential is unique in that the D Blocks are largely irregular in shape, especially those sites of sufficient size to accommodate an equivalent park. While the program and design of the park will be developed at a later design stage, several features proposed by residents include a planted green vine wall along the D1.2 building, public art, performance space, shaded seating, lounging and flexible play space. The park will be able to accommodate active, passive, and social activities. The community process during DSPR presents an opportunity to refine the programming goals and the design for this space.

D2 | Civic Open Space B and C

The arrival of new transit options to Union Square will help establish a new civic node for the Union Square neighborhood. The proposed gateway plaza for Union Square will serve to link this node with the existing neighborhood fabric by prioritizing connectivity to Union Square Plaza through the enhancement of the public realm and maximizing its utility to celebrate the quirky, artsy, and inclusive character of Union Square. As the first civic open space to be constructed as part of the first phase, the design approach to this public amenity has evolved with the support of community feedback and sustained coordination with the MBTA. Pedestrian access is prioritized in the proposed concept by providing direct, at grade access to Union Square Station and by replacing visual and physical barriers with vistas that are tied to Union Square landmarks, including: Prospect Hill Monument, Union Square Plaza and the Historic Post Office. Locating the

plaza at grade provides the added benefit of the gradual separation of public space from Prospect Street using the natural elevation of the street to define an ample space for assembly at the point of greatest separation; a point that similarly boasts ideal southern exposure. The sloping bank at this location also offers the opportunity for amphitheater style containment facing the plaza's large gathering area. The generous right-of-way, framed by green groundcover and extensive new tree canopy, provides the backdrop for sustained activation by commuters, employees, residents, and visitors alike, evolving the understanding of Prospect Street as a pedestrian-first street and incentivizing its utility to access the surrounding neighborhood. The plaza is designed to be welcoming and comfortable with sun and shade and a variety of seating alternatives, including permanent accommodations and movable tables and chairs to maximize its utility. The spatial organization accommodates ease of movement through the space, while providing for and encouraging lingering, meeting, and gathering for special events and/or impromptu performances. The space has been organized through a design concept rooted in history, bringing users from the new Union Square Station to the historic Union Square Plaza and back again.

Civic Open Space B Design Concept | Recalling Miller's River

A look back at history reveals that the Miller's River once passed through the D2 site and, although long disappeared, the memory of the river inspires the concept for the plaza. While not a literal tracing of the river's path, the proposed paving pattern and overall organization of the plaza design is inspired by the dynamics and movement of the Miller's River. The fluid flow of water provides a metaphor for the dynamic pedestrian connection from Union Square Station to the heart of Union Square. Lining each edge of the plaza are multiple pockets or "eddies" of seating, steps, and other gathering opportunities. The river's edge metaphor also provides a concept for the green buffer along Prospect Street. Sloping up like a river's bank, the buffer will be planted with trees and low plantings, and lined with a variety of types of seating, opportunistically penetrated from the street to encourage maximum utility. The latest conceptual design plan of the space has been provided as Figures 1-10 and 1-15.

Expansion Through the Public Process

Cognizant of the community's desire for increased open space, expanding the public realm remained a primary objective over the course of the plan's evolution. The current proposal increases the size of the open space by more than 33% than the size approved through the master planning process. This significant increase is in addition to the approximately 2,300 sf green area planned by US2 north of Union Square Station (noted as area B1 on Figure 1-15), which results in approximately 48% more improved open space in the first Project phase than required under the CDSP and existing zoning.

The totality of the new civic open space area was designed in concert with the active and transparent retail and lobby frontages proposed for the D2 buildings, which energize the transition from Union Square Station to Union Square, while preserving view corridors and enhancing wayfinding. The massing of the D2.2 and D2.3 buildings peels back from Prospect

Street, improving sight lines to the station entrance and leaving a generous green buffer between the plaza and street. The landscape edge at the street and the building facades, at grade, together will define an 'outdoor room' that offers pockets of space for different types of activity along the length of the plaza.

Multiple and Varied Activity Zones

The plaza has been organized to accommodate ease of movement to Union Square Station and for comfortable everyday uses and the special events that are characteristic of Union Square. A clear central zone, paved in a smooth material, provides a direct connection to the station. On either side of this movement zone are places for seating, gathering and other activities. At the sunny southern end of the plaza is an open hardscape area framed by seating and trees that creates flexible space for programmed events and circulation. The planted "bank" along Prospect Street is edged with benches and seat walls that create pockets of seating with differing orientations. A few over-sized seating platforms provide additional opportunities for seating or performances, and chairs can be moved as desired to complete these flexible gathering pockets. Throughout the plaza, ample and varied seating offer places to sip a coffee, chat with a friend or work on a laptop outside. A congregational area to the south faces a wide-open area with views to Union Square Station that can support outdoor performances and other flexible programming. This is the widest and sunniest part of the civic open space and offers a spot to watch a performance or participate in a public event, all while keeping an eye on train arrivals and departures. A byproduct of concentrating the largest plaza area adjacent the Union Square Station entry at the plaza's southern end is the extensive separation achieved from Prospect Street's vehicular lanes. Reaching a distance of approximately 125 linear feet from the nearest vehicular travel lane, the generous horizontal distance accommodates a multitude of arrangement options for the planned moveable tables and chairs which will remain flexible to the changing needs of the Plaza's occupants. Most significantly, this physical separation is enhanced with approximately 15 feet of vertical separation between the plaza surface and Prospect Street above. Making the most of the change in grades, the planted green buffer will support a new tree canopy to serve as a backdrop to the safe, pedestrian-centric space that provides for an active, and accessible path to Union Square Station. Features of the D2 civic open space are depicted in Figure 1-10.

Pedestrian Prioritization

The new plaza is situated at the level of Union Square Station, providing an easy and accessible connection to the heart of Union Square to the north. This portion of the plaza is proposed to be for the exclusive use of pedestrians; cyclists will be guided to Milk Alley to access Union Square Station. At the northern terminus of the defined civic open space, the plaza connects seamlessly with the mid-block connector of Bennett Court through a 'table-topped' condition that prioritizes its use for pedestrian passage. At the southern end, sidewalks along Charlestown Place are provided for pedestrians traveling eastbound. To provide convenient access and egress three connections are provided between the plaza

and Prospect Street: at the northernmost end – connecting to Prospect Street at grade; midway - through a low sculptural stair; and at the southernmost edge - with a south facing seating stair that doubles as a gathering space.

Alternative Travel Modes

Effectively managing transit modes is a priority of the D2 plan and the plaza accommodates multiple modes of arrival to and from the space. As a multi-modal hub with provisions for pedestrians, cyclists, and transit users, including patrons of The Ride paratransit service. To preserve D2's public open space for pedestrians, strategic interventions convert non-pedestrian commuters into pedestrians before they enter the public space. Figure 1-9 depicts transit modes through and around the D2 site, highlighting these areas of modal exchange.

Bicycles

Provisions for cyclists around the D2 site include a dedicated bike lane northbound on Prospect Street, and a dedicated east-west lane abutting the north end of the site along Somerville Avenue. The Somerville Avenue Streetscape Improvement project that is currently underway improves this east-west travel lane for cyclists by separating them from the street. The improvements to the D2 site are planned and integrated into this condition. Cyclists traveling along Prospect Street will be accommodated through Bennett Court, allowing for access to retail opportunities, secure bicycle parking within the buildings (D2.1, D2.2 or D2.3), or accessing Milk Alley en route to Union Square Station through Charlestown Place at the southern end of the site.

Cyclists traveling along Somerville Avenue will be served in a similar manner, through access to the shared Milk Alley and with opportunities to connect to retail and building accommodations along Bennett Court, or the Union Square Station facilities at Charlestown Place.

Ample accommodations are planned for both short and longer visits by cyclists. In total, approximately 683 bicycle parking spaces, with approximately 499 of these planned internal to the buildings, are proposed as part of the development of D2. Approximately 64 exterior, shorter terms spaces are strategically positioned at all edges of the open space, to intercept cyclists before entering the plaza and ensuring that the plaza remains a pedestrian zone. An additional 120 bicycle parking spaces are provided by US2 for the MBTA, with 90 of these enclosed in a sheltered and secured facility. The full scope of the Project's bicycle infrastructure is depicted on Figure 1-17; note that the figure provides more details about D2, where plans are more refined, although these details are subject to change during the DSPR process for each Lot.

D3 | Civic Open Spaces D, E, and F

The civic open spaces on D3.1 and D3.2 extend the civic open space environment planned for D2 southward, giving a cohesive pedestrian character to the street edge on the east side of Prospect Street and Webster Avenue on D2 and D3. The synergy between active ground level uses in the proposed D3 buildings and these civic open spaces will continue to build on the goal for a vibrant pedestrian environment envisioned in the Neighborhood Plan. In response to community comments, civic open space E on D3.2 was relocated from Windsor Street to Webster Avenue to create a larger buffer between the Webster Avenue residents and the new development on D3.

At the southern edge of D3.3, a smaller scaled civic open space provides a point of connection between the proposed commercial building on D3.3 and the street environment. This space, in combination with a larger open space planned to the south of Windsor Place as part of the Boynton Yards redevelopment, will create a generously scaled sun filled open space at the entry to Boynton Yards.

D4 | Civic Open Spaces G, H, and I

During the Neighborhood Plan process, D4.3 was the proposed location of the neighborhood park. In response to community feedback that D4.3 was not a preferred site for the park, the park was relocated to D1 as part of the CDSP plan. Consequently, a portion of D1's residential building program was relocated to the D4.3 site; however, the proposed plan for D4.3 preserves space for the Concord Avenue Community Garden. Preservation of this community space was a priority identified by Union United in 2014 and was included in the Neighborhood Plan. Across Webster Street, D4.2 provides an opportunity for a pocket park, green or pocket plaza. Located at a prominent position when entering from Cambridge into Union Square, this site could be a location for a gateway marker into Union Square.

Along the western edge of D4.1 is a civic open space that lines the edge of the building, providing a quiet green connection into the neighborhood, as well as the potential for programs located in D4.1 to spill out onto the passageway and further animate it. This civic open space reinforces a pedestrian desire line expressed by community members as part of the interactive activity at one of the CDSP community meetings.

D5 | Civic Open Spaces

No civic open spaces will be located on D5 given the small scale of the site. Fortunately, their proximity to the planned Neighborhood Park and Union Square Plaza will provide significant outdoor opportunities to D5 tenants and residents.

Union Square Somerville, Massachusetts

Figure 1-17

Bicycle Infrastructure and Circulation

D6 | Civic Open Space J

D6 is located along Somerville Avenue, directly opposite Union Square Plaza. While the Neighborhood Plan included a narrow passageway between D6.1 and D6.2 and a small plaza located along Prospect Street, the opportunity to widen the through-block connection to allow for more sunlight and air to penetrate to the center of the block influenced the plans for the site. As a result, this civic open passage is planned to capture pedestrian traffic for a quieter alley off of Prospect Street, providing a new point of entry to Union Square Plaza and responding to community requests for a pedestrian pathway at this location.

D7 | Civic Open Space K

In alignment with community interests in serving Properzi Manor to the north of the Block and providing additional civic open space for this portion of the neighborhood, an approximately 6,000 sf civic open space is planned for D7, fulfilling neighborhood aspirations for increased connectivity. The D7.2 civic open space, which could be a pocket park or green, can be designed as a green oasis that also provides inter-block connectivity between Stone Street, Somerville Avenue and Properzi Manor – a suggestion made by residents. Residents of both the new building on D7.2 and Properzi Manor could be provided with direct access to the park. The potential park is of a scale that accommodates groups and individuals, offering a variety of seating and lounging spaces, as well as active areas that may include an "art walk" to an expanded plaza area on Somerville Avenue.

1.2.5 Parking

The Project proposes a total of approximately 1,495 off-street parking spaces that will be constructed in phases and have been planned to maximize shared parking. Public parking will be concentrated on D1, D2, D3 and D6, while D4, D5 and D7 will only provide accessory parking. The public parking is proposed to be accessed from outside of the heart of Union Square, on Concord Avenue, Everett Street, Webster Avenue, Prospect Street and Somerville Avenue, a best practice that is anticipated to intercept traffic before it gets to Union Square's commercial core. Another priority of the plan is the screening of the above-ground parking structures from the pedestrian realm on 'pedestrian streets', as designated by the Union Square Zoning. In all instances, active uses screen the potential visual impact of these garages on the public realm along pedestrian streets. The Project includes below-grade parking on portions of D1 and D6 where below-grade parking appears feasible, while site topography on D3 provides for one parking level below finish grade. These design assumptions will be validated when detailed Lot designs are developed as the Project is implemented. Vehicular points of access to these garages occurs from alleys or mid-block thoroughfares – away from the pedestrian sphere – further preserving neighborhood aesthetics. Figure 1-12 depicts these parking and access locations relative to the open space network. Table 1-1 includes the proposed parking numbers by Lot.

1.3 GLX Coordination

As requested in the DEIR Certificate, this section provides detailed information, including plans, which reflect the Project's coordination with the GLX.

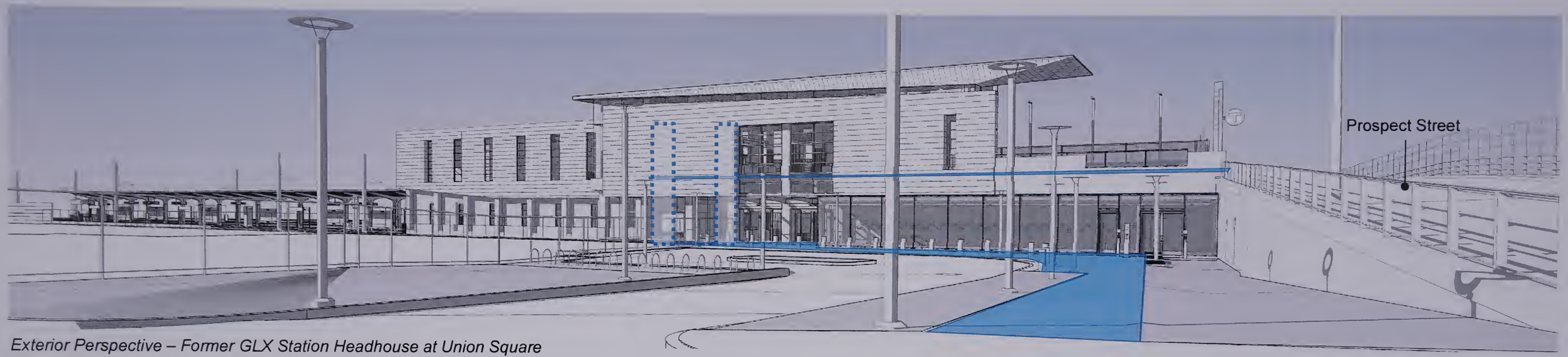
The MBTA's $2.3 billion GLX project is a catalyst for Union Square's revitalization into the mixed-use and transit-oriented urban jobs center envisioned by the City's comprehensive plan, *SomerVision*. Union Square Station will not only provide much anticipated transit connectivity to the MBTA network but will also provide significant environmental benefits to one of the densest communities in the region. To ensure the successful arrival of transit service in Union Square, US2 has been a committed partner to the MBTA and the City since being designated master developer in mid-2014.

Early dialogue among the parties focused on coordinating design and logistics and was based on the 'original' GLX design that anticipated a 2017 GLX opening. When the MBTA identified the budget challenges in mid-2015 and the GLX project stalled, US2 worked with the parties to identify opportunities for US2 to help bring the GLX project back into budget and preserve its feasibility. While the GLX project was being re-evaluated and despite its uncertain future, US2 affirmed its partnership with Somerville and collaborated to advance the Neighborhood Plan over an 18-month period from early 2015 to mid-2016.

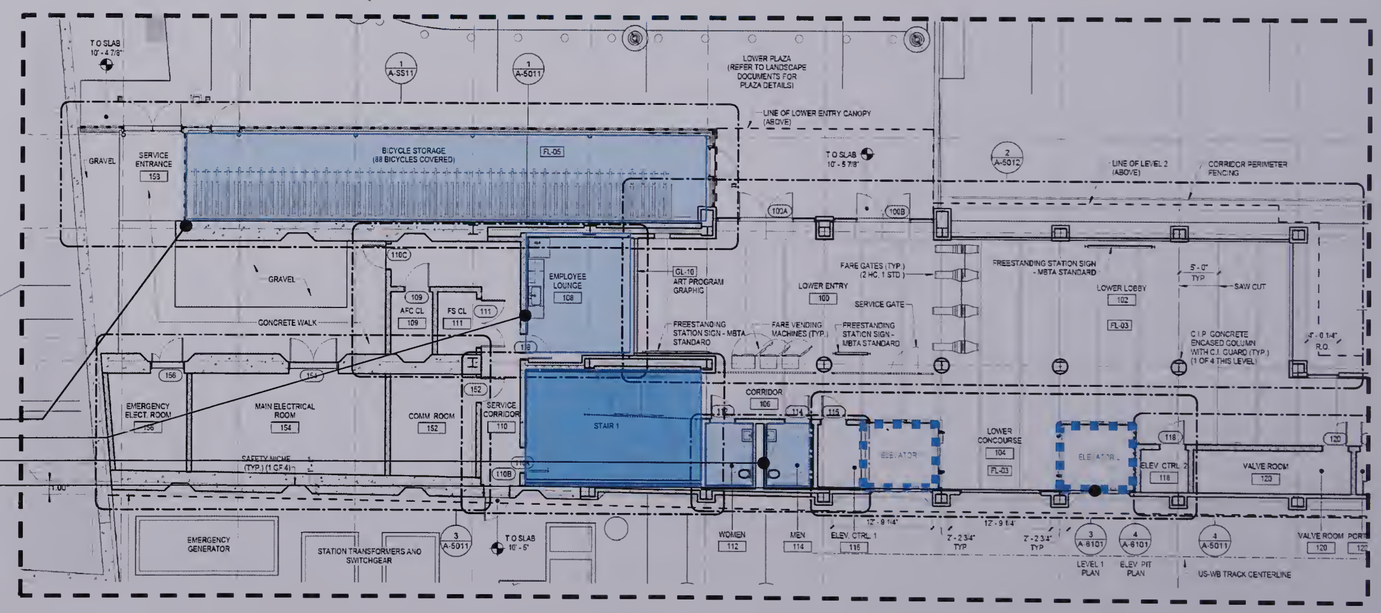
As part of that process to redefine the GLX project to make it feasible, the City committed to fund $50 million to help close the budget gap, a portion of which would be provided by US2 as described further below.

In remaking the GLX project and closing the budget gap, the scope of Union Square Station, like many GLX stations, was modified. The 'original' station design was a two-story headhouse that connected the Prospect Street bridge to the platform below via an elevator and stair. The design also included access to the platform from an at-grade walkway leading north from the headhouse and connecting to the Prospect Street sidewalk near Bennett Street. The headhouse included bike storage, a breakroom for MBTA employees, and a restroom to support the station's 'end of line' operation. Figure 1-18 describes the original station design and its points of access.

In an effort to preserve the GLX project and address budget constraints, the station headhouse, including the stair and elevator, was eliminated by the GLX project team. Figure 1-19 depicts the current station design. Simultaneously, in order to facilitate the GLX, US2 agreed to provide certain elements that support the station within its Project design.



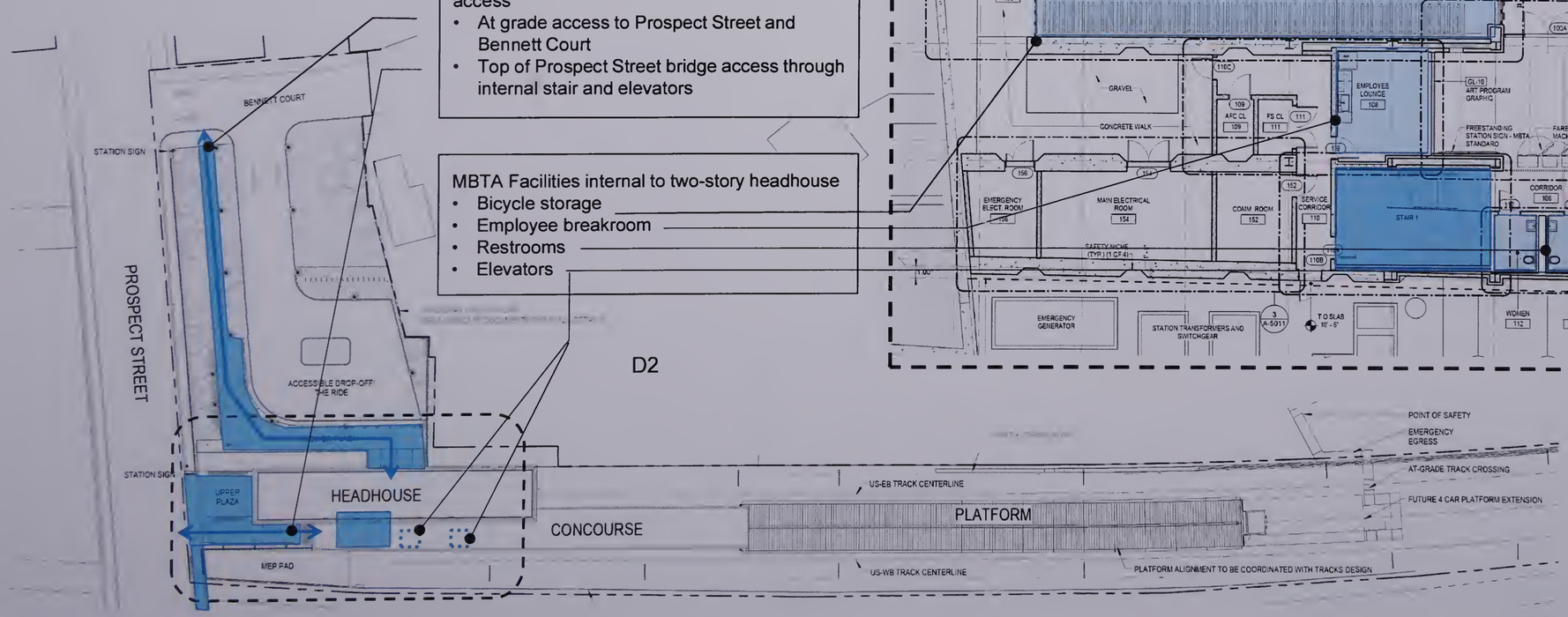
Exterior Perspective – Former GLX Station Headhouse at Union Square
Lower Plaza Approach facing south



Station Lower Level Headhouse Floor Plan

Two-story headhouse provided multiple points of access
- At grade access to Prospect Street and Bennett Court
- Top of Prospect Street bridge access through internal stair and elevators

MBTA Facilities internal to two-story headhouse
- Bicycle storage
- Employee breakroom
- Restrooms
- Elevators

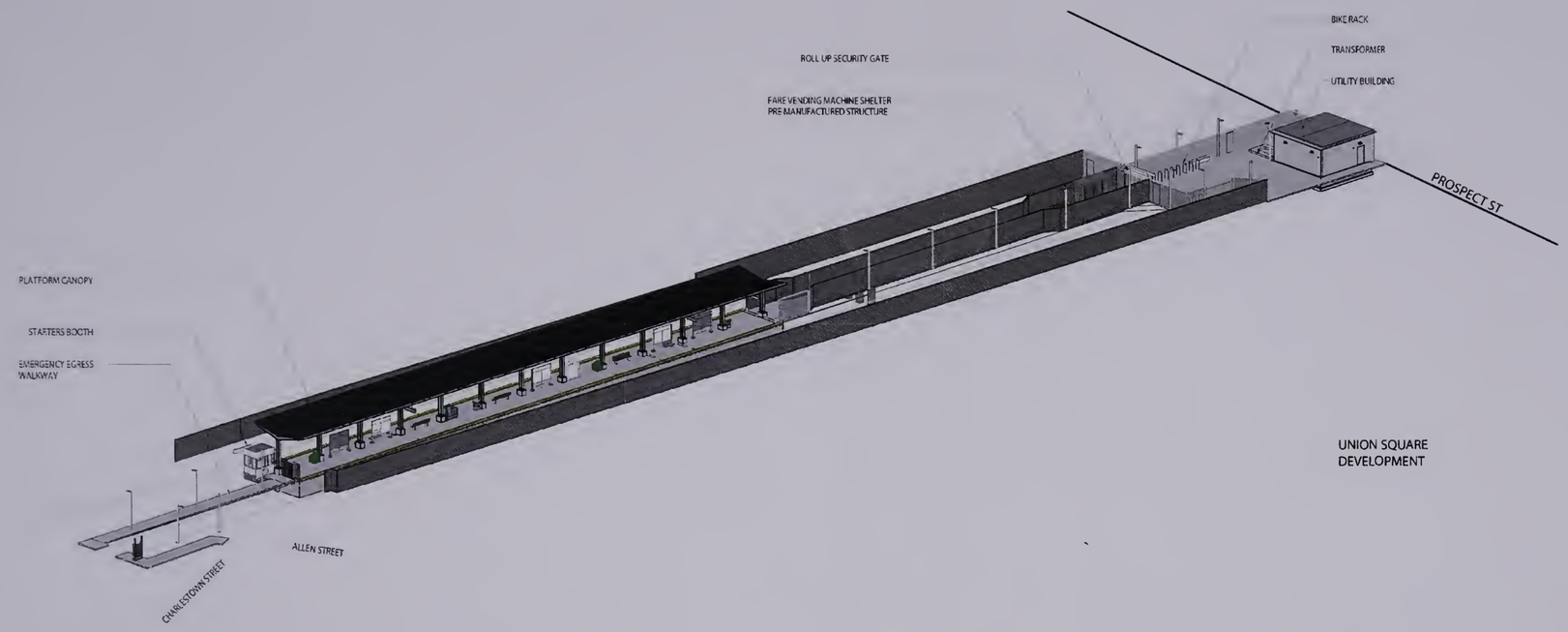


D2

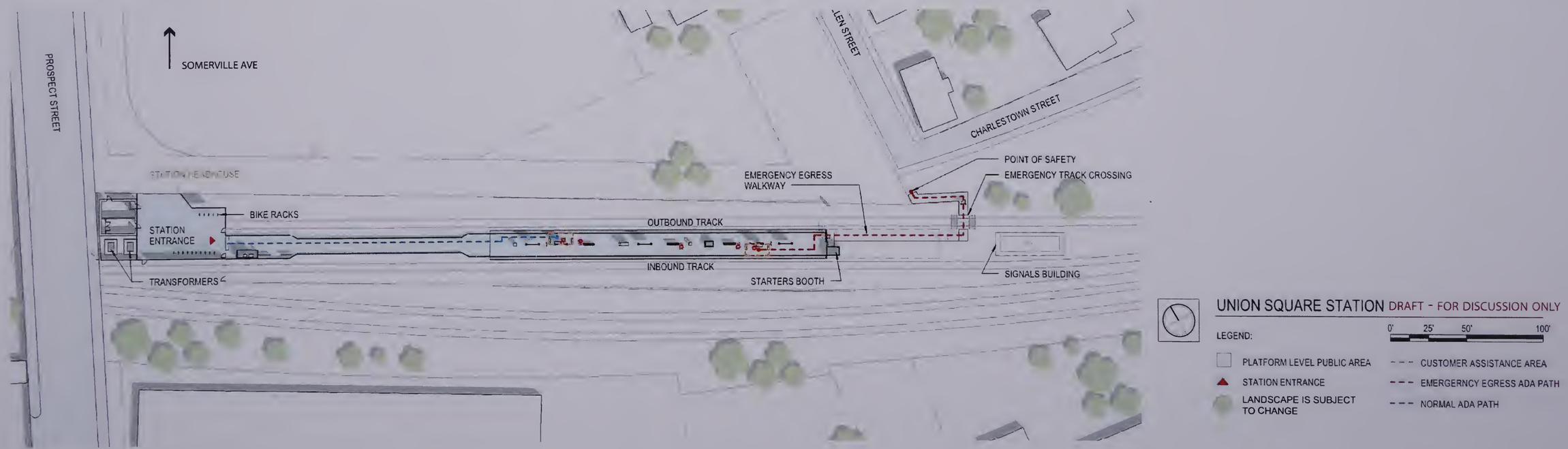
D2 Site Plan at GLX Station

Union Square Somerville, Massachusetts

Figure 1-18
Former Union Square GLX Station (2015 Design)



Axonometric of in progress design of Union Square GLX Station



Site Plan of in progress design of Union Square GLX Station

Figure 1-19

Current Union Square Station Design (2019)

US2's GLX Commitments

US2 agreed to provide the following improvements to facilitate Union Square Station operations and access as documented in a Letter of Intent (LOI) between US2, the City and the MBTA:

- Creation of a plaza that includes an ADA compliant path from the station platform to the Prospect Street sidewalk at Bennett Street.
- Construction of an employee lounge, janitor closet and restrooms for MBTA employees.
- Provision for a drop-off area on the Project property for The Ride, the MBTA's paratransit service.
- Provision of 90 sheltered and secured MBTA bicycle parking spaces and MBTA racks for 30 bicycles.
- More recently, after the LOI was executed and as part of continued coordination, US2 agreed to allow the MBTA to connect to a proposed water main on the D2 site so that water service could be provided to the station area. This connection significantly shortens the required length of the MBTA's water main and reduces the MBTA's expense for this service.

In addition to the physical improvements, US2 also agreed to the following to support the GLX project:

- Fund more than $5.8 million to the City to help offset the City's financial commitment to the GLX project.
- Convey a permanent easement to the MBTA across the portion of D2 that includes the station area so the MBTA can construct, operate, maintain, repair and replace the GLX. US2 will purchase the entire D2 Block from the SRA and will provide the easement at no cost to the MBTA. Figure 1-3 is a conceptual diagram of the easement areas. The parties are in the process of finalizing the easement locations and documenting easement agreements.
- Work with MBTA, GLX project team and City to provide the construction easements necessary to construct the MBTA station and simultaneously provide for construction of the D2 buildings and the related station improvements.

US2's Coordination with GLX/MBTA

Since June 2018, US2 has been meeting regularly with the GLX project team, MBTA and the City to further refine the designs, operational integration, and construction logistics of Union Square Station and the D2 portion of the Project. More than 16 meetings have occurred, and the parties

continue to meet on a bi-monthly basis. Recently, US2 met with the GLX contractor to walk the D2 site and discuss construction logistics as the commencement of construction of Union Square Station is planned for the third quarter of 2019.

Over the course of this dialogue, US2 shared the evolution of the D2 design with the MBTA and GLX project team and has received interim MBTA comments. This review loop has occurred during the process around the CDSP's issuance, and then, subsequently, in parallel with US2's progress through the City's DSPR process. US2 has endeavored to incorporate into the design the MBTA's comments provided during these discussions, including the MBTA's preference to lower the civic open space from the Prospect Street sidewalk elevation to station grade to facilitate a better accessible path and a clear sightline to the station for MBTA patrons approaching from the north (see Figure 1-20).

US2 pursued a significant redesign of the D2 plaza during the early phases of the DSPR process in response to the MBTA's preference. The resulting design is more akin to the pedestrian connection that was provided in the original Union Square Station design. The latest D2 site plan, Figure 1-21, depicts how the station design and D2 design interrelate, and identifies the station-supporting improvements that will be provided by US2.

Circulation to and from the station for pedestrians, vehicles and cyclists is important to the success of the station and the Project. Throughout the D2 design process, US2 has been focused on refining the approach to station access based on feedback from Project stakeholders. Care has been taken to provide routes for various modes of transportation that avoid creating points of conflict between transit modes. This was of particular concern to the Somerville Design Review Committee. As the design evolved, emphasis was placed on ensuring that the D2 plaza open space remains a pedestrian only space, and that points of modal exchange are provided on all sides of the open space. Figure 1-9 is a detailed plan that depicts D2's design approach to routing the various modes (vehicular, pedestrian and bicycle access) around the site and to the station.

As part of the discussions concerning the circulation solution, area stakeholders, including local elected officials, expressed a need for access to the MBTA station from the top of the Prospect Street bridge. This is particularly important for the station's service area south of the tracks, which includes parts of Somerville and Cambridge. Figure 1-22 depicts the station service area.

The MBTA's elevator and stair in the 'original' station design resolved this circulation issue but was removed by the MBTA in the redesigned GLX project. MBTA patrons arriving from or departing to the southern service area traverse the Prospect Street sidewalk extending over the bridge. Preliminary examination of design conditions and constraints near the station and on the Prospect Street bridge suggest that an elevator would be best situated either on the D2 property immediately north of the current permanent MBTA easement or between the track locations and within the MBTA right-of-way. Each location has opportunities and challenges that are being evaluated by the parties as part of an ongoing dialogue. In order to improve circulation from the

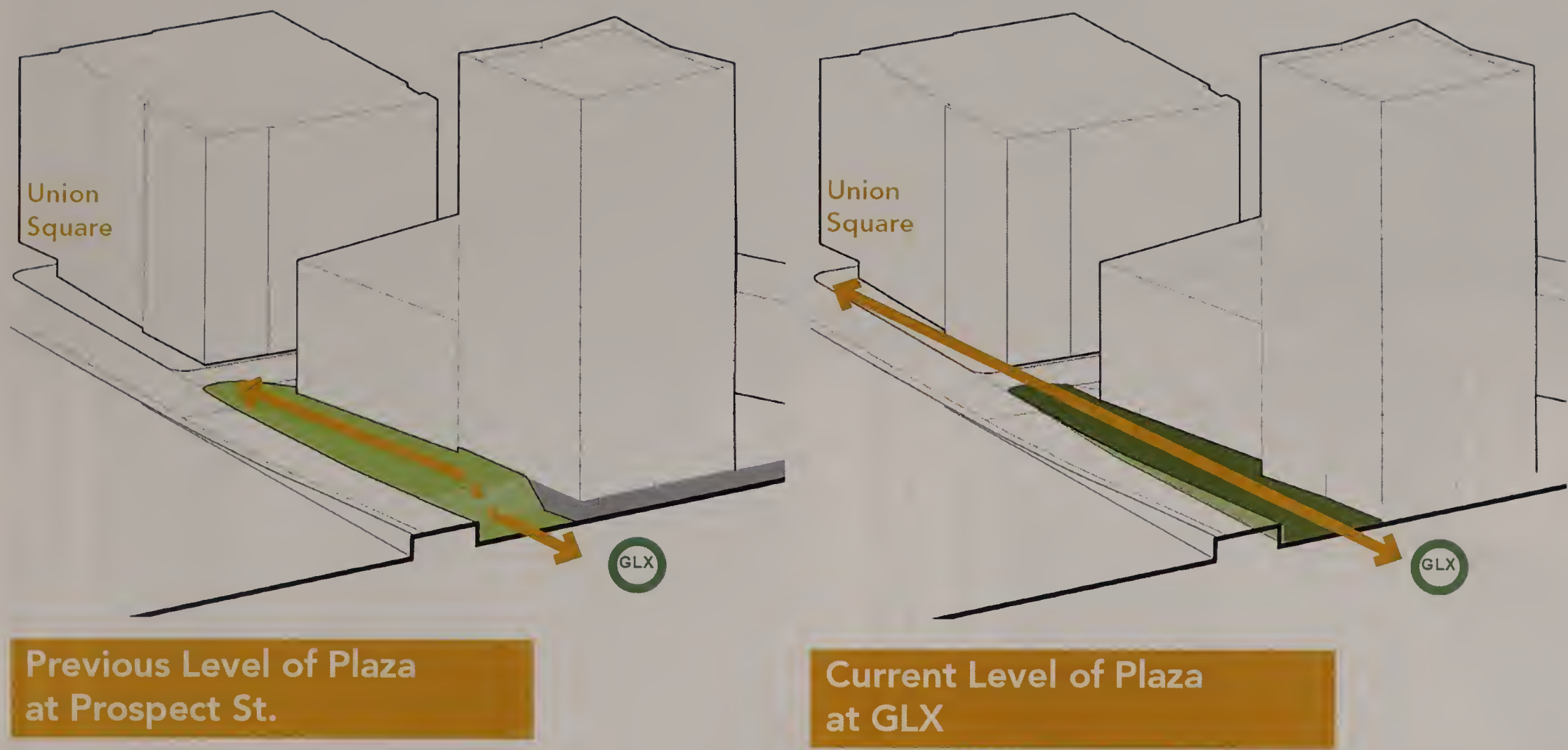
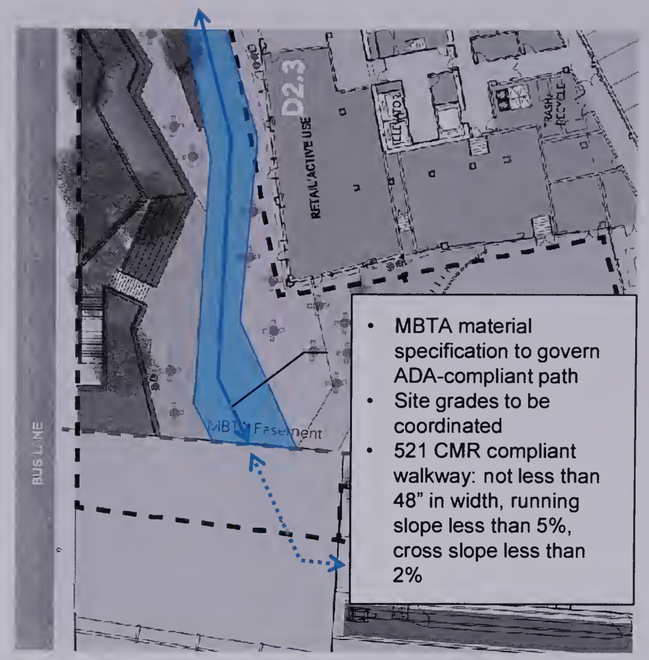
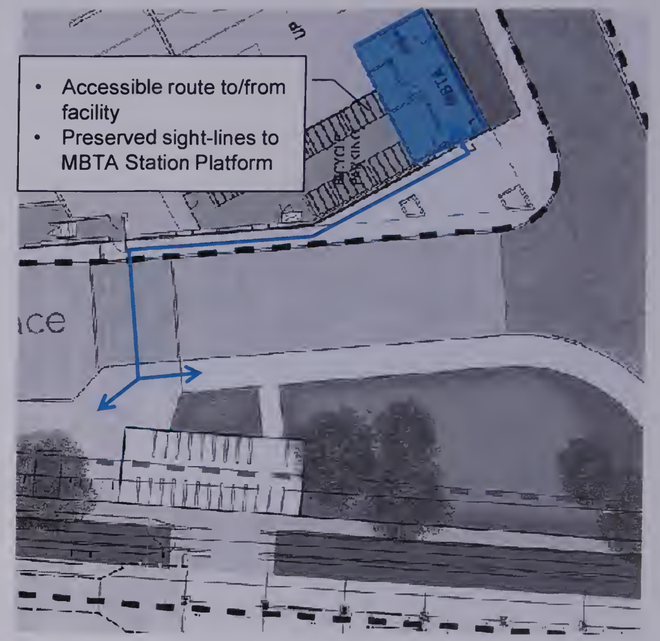


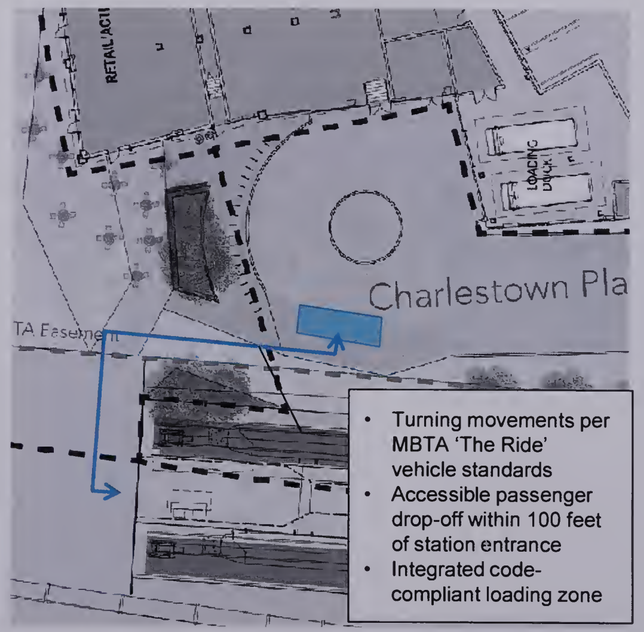
Figure 1-20
Prospect Street Sidewalk Elevation



(A) At grade, ADA compliant access to and from Prospect Street and Bennett Court to the MBTA Station



(B) Construction of an employee lounge, janitor closet and restrooms for MBTA employees



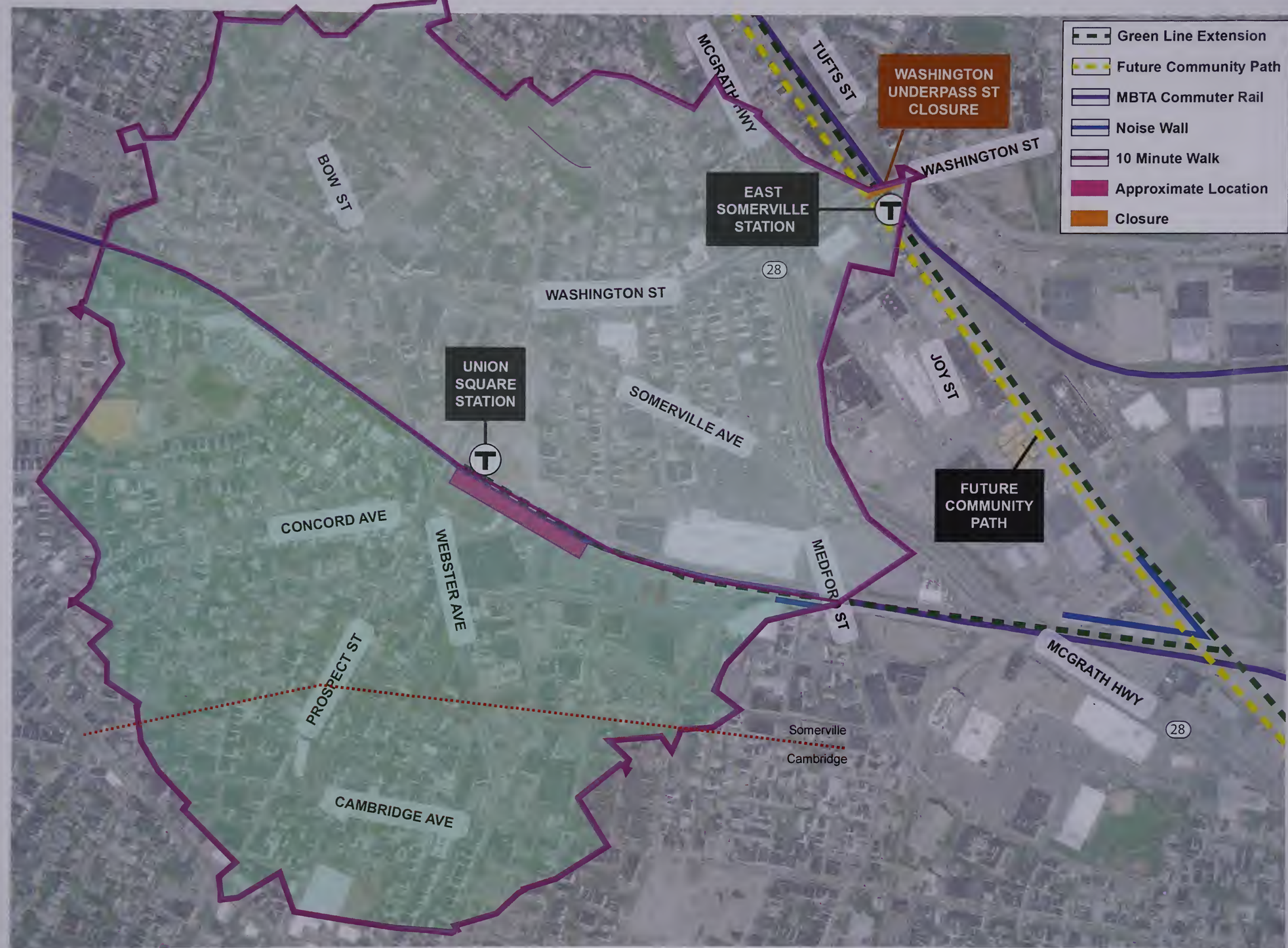
(C) Provision for MBTA's 'The Ride' paratransit service drop-off

(D) Provision of 90 sheltered and secured bicycle parking spaces + 30 additional spaces

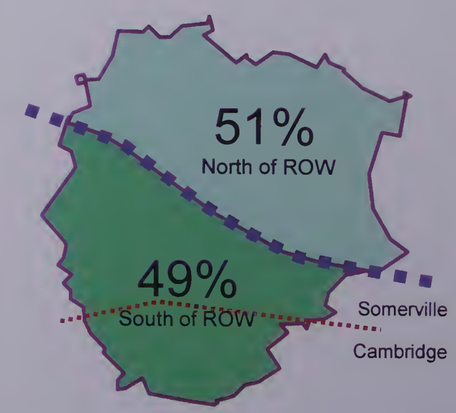
Union Square Somerville, Massachusetts

Figure 1-21

D2 Site Plan with Improvements to be Provided by Proponent in Support of the Station



Union Square Station Service Area



Union Square Somerville, Massachusetts

Figure 1-22

MBTA Union Square Station Service Area

station to the Prospect Street bridge, although primarily for MBTA patrons and not for Project tenants and residents, US2 has offered to amend the D2 design and allow for MBTA improvements on the D2 property, as required to make way for the elevator to be constructed by the MBTA, and/or for installation by the MBTA of a stair adjacent to the elevator location, and has agreed to grant an easement to the MBTA to accommodate this at no cost to the MBTA. US2 has also offered to share the cost for the MBTA's elevator to the station. US2 will continue to coordinate with the MBTA, the City and other stakeholders on this issue and remains hopeful that a solution to the MBTA elevator will be identified.

1.4 City of Somerville Streetscape and Infrastructure Improvements

The modernization of Union Square's infrastructure is the foundation for the area's revitalization and a key to enabling private investment development and unlocking Project public benefits. To improve current conditions, and in support of the development of Union Square, the City has planned, started or completed several projects to improve transportation and renew outdated public infrastructure in the neighborhood. The Project is critical to funding the infrastructure program via monetary contributions (estimated at $4.6 million); new property taxes that support the City's debt obligations for the improvement program; and the private investment required to obtain $16 million in MassWorks Grants from the Commonwealth. Upon completion, the overall program will have significant benefits to residents, workers and to the environment. The MLDA identifies the following infrastructure improvements to be implemented in phases by the City as the Project is developed (also see Figure 1-23):

- **Early Action Utility and Streetscape (completed).** To date, localized improvements have been completed to improve vehicular circulation and provide safer pedestrian and cyclist routes. Prospect Street and Webster Avenue have been converted to accommodate two-way traffic between Prospect Street/Webster Avenue and Somerville Avenue, and Newton Street has been modified to restrict through vehicle traffic between Webster Avenue and Prospect Street. Completed pedestrian and cyclist improvements include: new signal timing, a new Somerville Avenue pedestrian crossing, enhancements to existing pedestrian crossings and improvements to the bicycle network.

  Somerville Avenue Utility and Streetscape Improvements (under construction). The next phase of transportation and infrastructure work, the $63 million Somerville Avenue Utility and Streetscape Improvements project, is under construction. This project will address legacy stormwater flooding issues, upgrade 100-year old sewer and water utilities, add green stormwater infrastructure and enhanced streetscape improvements with pedestrian, transit rider, cyclist and vehicular improvements. To better manage stormwater flows an 800,000-gallon box culvert will be installed underneath Somerville Avenue from Union Square to Medford Street. Sanitary sewers will be separated from stormwater lines, and water mains will be renewed to provide reliable service for the future. Above ground, a *Complete Streets* approach to the street right-of-way will yield wider sidewalks for pedestrians and bike lanes on each side of the street, fully separated

Union Square Somerville, Massachusetts

Figure 1-23

City of Somerville Infrastructure Exhibit

from vehicle lanes. Better sightlines and reduced crossing distances will also contribute to a safer and more walkable and bikeable Union Square. These improvements started in spring 2018 and are projected for completion in 2021 (i.e., coincident with completion of the first phase of the Project). Additional details regarding this infrastructure phase are provided in pages 1-24 through 1-26 of the DEIR.

- **Additional Utility and Streetscape Improvements (preliminary design planned for 2019-2020).** The final phases of transportation and infrastructure improvements include the implementation of the *Complete Streets* concepts of the Neighborhood Plan for improving traffic, cyclist and pedestrian movements throughout the neighborhood, as well as additional stormwater infrastructure. Streetscape improvements are focused on Washington Street, Webster Avenue, Prospect Street and Somerville Avenue/Bow Street West, and related intersections. Union Square Plaza will undergo a significant renovation aimed at making it more pedestrian friendly and flexible. An excerpt from the Neighborhood Plan that includes the planning-level concepts for these streetscape and intersection improvements that will be the basis of engineering designs is included as Appendix D4. Lastly, stormwater management improvements to connect the Somerville Avenue box culvert (east of Medford Street) to the GLX stormwater outfall system via a pump station (the "Redbridge Outfall") will be completed. The MLDA projects City completion of these improvements at the end of 2022.

1.5 Statutory and Regulatory Standards and Requirements

Tables 1-4 to 1-7 presents a preliminary list of permits and approvals from local, state and federal agencies that are expected to be required for each phase of the Project, as requested in the DEIR Certificate, based on currently available information. It is possible that only some of these permits or actions will be required, or that additional permits or actions will be required.

Table 1-4 Anticipated Permits and Approvals (Phase 1)

Agency Name	Permit / Approval / Review
FEDERAL	
U.S. Environmental Protection Agency	Notice of Intent in accordance with National Pollutant Discharge Elimination System
	Stormwater Pollution Prevention Plan
Federal Aviation Administration	Determination of Non-Hazard to Air Navigation
STATE	
Department of Environmental Protection	Sewer Connection Permit
	Cross Connection Permit (if required)
	Environmental Remediation (if required)
Department of Transportation	Chapter 40, Section 54A approval
Massachusetts Bay Transportation Authority	Easement Agreement respecting Union Square Station temporary and permanent easements and construction of improvements
Massachusetts Historical Commission	State Register Review

Table 1-4 Anticipated Permits and Approvals (Phase 1) (Continued)

Agency Name	Permit / Approval / Review
STATE (continued)	
Department of Housing and Community Development	Approval of SRA land conveyances under Master Land Disposition Agreement for D2 Block and under Land Disposition Agreements for other Lots
Massachusetts Water Resources Authority	Temporary Construction Dewatering Permit (if required)
	Industrial Use Discharge Permit (if required)
LOCAL	
Somerville Planning Board	Coordinated Development Special Permit
	Design and Site Plan Review approval for each individual building, including any subdivision of land
Somerville Fire Department	Permits and Approvals for Fuel Storage, Fire Safety Equipment, Alarm System, Sprinkler, Standpipe, Smoke Control and Hydrant
Somerville Inspectional Services Department	Building Permit, Electrical and Gas Permits
	Demolition Permit
Somerville Department of Public Works	Street Occupancy and Opening Permit
	Trench Permit, if required
	Street Occupancy, Alteration/Encroachment/ Overhang, Tieback Retention System, and Sidewalk Alteration Permits
	Backflow Preventer, Hydrant, Sewer Connection, Stormwater System, and Water Permits
	Permits and Approvals for Curb Cut, Driveway Opening/Closing & Street Lighting
	Grants of Location
	Construction Traffic Management Plan
Somerville Redevelopment Authority (SRA)	Completion of land acquisition process pursuant to Master Land Disposition Agreement (MLDA) with SRA
	Land Disposition Agreements (LDAs) with SRA for each individual lot other than lots for the development of D2 Block, and completion of land acquisition process thereunder
	Certificates of Compliance under MLDA or applicable LDA
Somerville Director of Transportation and Infrastructure	Mobility Management Plan
Somerville Office of Strategic Planning and Community Development, Housing Division	Affordable Housing Implementation Plan

Table 1-5 Anticipated Permits and Approvals (Phase 2)

Agency Name	Permit / Approval / Review
FEDERAL	
U.S. Environmental Protection Agency	Notice of Intent in accordance with National Pollutant Discharge Elimination System
	Stormwater Pollution Prevention Plan
STATE	
Department of Environmental Protection	Sewer Connection Permit
	Cross Connection Permit (if required)
	Environmental Remediation (if required)
Department of Transportation	Chapter 40, Section 54A approval
Massachusetts Bay Transportation Authority	Easement Agreement respecting Union Square Station temporary and permanent easements and construction of improvements
Massachusetts Historical Commission	State Register Review
Department of Housing and Community Development	Approval of SRA land conveyances under Master Land Disposition Agreement for D2 Block and under Land Disposition Agreements for other Lots
Massachusetts Water Resources Authority	Temporary Construction Dewatering Permit (if required)
	Industrial Use Discharge Permit (if required)
LOCAL	
Somerville Planning Board	Coordinated Development Special Permit
	Design and Site Plan Review approval for each individual building, including any subdivision of land
Somerville Fire Department	Permits and Approvals for Fuel Storage, Fire Safety Equipment, Alarm System, Sprinkler, Standpipe, Smoke Control and Hydrant
Somerville Inspectional Services Department	Building Permit, Electrical and Gas Permits
	Demolition Permit
Somerville Department of Public Works	Street Occupancy and Opening Permit
	Trench Permit, if required
	Street Occupancy, Alteration/Encroachment/ Overhang, Tieback Retention System, and Sidewalk Alteration Permits
	Backflow Preventer, Hydrant, Sewer Connection, Stormwater System, and Water Permits
	Permits and Approvals for Curb Cut, Driveway Opening/Closing & Street Lighting
	Grants of Location
	Construction Traffic Management Plan
Somerville Redevelopment Authority (SRA)	Completion of land acquisition process pursuant to Master Land Disposition Agreement (MLDA) with SRA
	Land Disposition Agreements (LDAs) with SRA for each individual lot other than lots for the development of D2 Block, and completion of land acquisition process thereunder
	Certificates of Compliance under MLDA or applicable LDA
Somerville Director of Transportation and Infrastructure	Mobility Management Plan
Somerville Office of Strategic Planning and Community Development, Housing Division	Affordable Housing Implementation Plan

Table 1-6 Anticipated Permits and Approvals (Phase 3 - South)

Agency Name	Permit / Approval / Review
FEDERAL	
U.S. Environmental Protection Agency	Notice of Intent in accordance with National Pollutant Discharge Elimination System
	Stormwater Pollution Prevention Plan
Federal Aviation Administration	Determination of Non-Hazard to Air Navigation
STATE	
Department of Environmental Protection	Sewer Connection Permit
	Cross Connection Permit (if required)
	Environmental Remediation (if required)
Department of Transportation	Chapter 40, Section 54A approval
Massachusetts Bay Transportation Authority	Easement Agreement respecting Union Square Station temporary and permanent easements and construction of improvements
Massachusetts Historical Commission	State Register Review
Department of Housing and Community Development	Approval of SRA land conveyances under Master Land Disposition Agreement for D2 Block and under Land Disposition Agreements for other Lots
Massachusetts Water Resources Authority	Temporary Construction Dewatering Permit (if required)
	Industrial Use Discharge Permit (if required)
LOCAL	
Somerville Planning Board	Coordinated Development Special Permit
	Design and Site Plan Review approval for each individual building, including any subdivision of land
Somerville Fire Department	Permits and Approvals for Fuel Storage, Fire Safety Equipment, Alarm System, Sprinkler, Standpipe, Smoke Control and Hydrant
Somerville Inspectional Services Department	Building Permit, Electrical and Gas Permits
	Demolition Permit
Somerville Department of Public Works	Street Occupancy and Opening Permit
	Trench Permit, if required
	Street Occupancy, Alteration/Encroachment/ Overhang, Tieback Retention System, and Sidewalk Alteration Permits
	Backflow Preventer, Hydrant, Sewer Connection, Stormwater System, and Water Permits
	Permits and Approvals for Curb Cut, Driveway Opening/Closing & Street Lighting
	Grants of Location
	Construction Traffic Management Plan
Somerville Redevelopment Authority (SRA)	Completion of land acquisition process pursuant to Master Land Disposition Agreement (MLDA) with SRA
	Land Disposition Agreements (LDAs) with SRA for each individual lot other than lots for the development of D2 Block, and completion of land acquisition process thereunder
	Certificates of Compliance under MLDA or applicable LDA

Table 1-6 Anticipated Permits and Approvals (Phase 3 - South) (Continued)

Agency Name	Permit / Approval / Review
LOCAL (continued)	
Somerville Director of Transportation and Infrastructure	Mobility Management Plan
Somerville Office of Strategic Planning and Community Development, Housing Division	Affordable Housing Implementation Plan

Table 1-7 Anticipated Permits and Approvals (Phase 3 - North)

Agency Name	Permit / Approval / Review
FEDERAL	
U.S. Environmental Protection Agency	Notice of Intent in accordance with National Pollutant Discharge Elimination System
	Stormwater Pollution Prevention Plan
STATE	
Department of Environmental Protection	Sewer Connection Permit
	Cross Connection Permit (if required)
	Environmental Remediation (if required)
Department of Transportation	Chapter 40, Section 54A approval
Massachusetts Bay Transportation Authority	Easement Agreement respecting Union Square Station temporary and permanent easements and construction of improvements
Massachusetts Historical Commission	State Register Review
Department of Housing and Community Development	Approval of SRA land conveyances under Master Land Disposition Agreement for D2 Block and under Land Disposition Agreements for other Lots
Massachusetts Water Resources Authority	Temporary Construction Dewatering Permit (if required)
	Industrial Use Discharge Permit (if required)
LOCAL	
Somerville Planning Board	Coordinated Development Special Permit
	Design and Site Plan Review approval for each individual building, including any subdivision of land
Somerville Fire Department	Permits and Approvals for Fuel Storage, Fire Safety Equipment, Alarm System, Sprinkler, Standpipe, Smoke Control and Hydrant
Somerville Inspectional Services Department	Building Permit, Electrical and Gas Permits
	Demolition Permit

Table 1-7 Anticipated Permits and Approvals (Phase 3 - North) (Continued)

Agency Name	Permit / Approval / Review
LOCAL (continued)	
Somerville Department of Public Works	Street Occupancy and Opening Permit
	Trench Permit, if required
	Street Occupancy, Alteration/Encroachment/ Overhang, Tieback Retention System, and Sidewalk Alteration Permits
	Backflow Preventer, Hydrant, Sewer Connection, Stormwater System, and Water Permits
	Permits and Approvals for Curb Cut, Driveway Opening/Closing & Street Lighting
	Grants of Location
	Construction Traffic Management Plan
Somerville Redevelopment Authority (SRA)	Completion of land acquisition process pursuant to Master Land Disposition Agreement (MLDA) with SRA
	Land Disposition Agreements (LDAs) with SRA for each individual lot other than lots for the development of D2 Block, and completion of land acquisition process thereunder
	Certificates of Compliance under MLDA or applicable LDA
Somerville Director of Transportation and Infrastructure	Mobility Management Plan
Somerville Office of Strategic Planning and Community Development, Housing Division	Affordable Housing Implementation Plan

1.5.1 Federal

1.5.1.1 Federal Aviation Administration, Determination of No Hazard to Air Navigation

The Federal Aviation Administration requires that Individuals/Organizations proposing construction or alterations must submit Form 7460-1, "Notice of Proposed Construction or Alteration." Information about the alteration and attachments showing the type and location of the alteration must also be submitted.

US2 will submit Form 7640-1 at least 45 days before the start date of the proposed construction or the date an application for a construction permit is filed, whichever is earliest.

1.5.1.2 U.S. Environmental Protection Agency, NPDES Notice of Intent for Construction

The National Pollutant Discharge Elimination System (NPDES) program requires that a construction project that will disturb one or more acres of land and will discharge stormwater into waters of the United States obtain coverage under a U.S. Environmental Protection Agency (EPA) Construction General Permit to minimize pollutant runoff from the site. In addition, if dewatering is required to control groundwater during construction and the groundwater contains pollutants, a NPDES Remediation General Permit may be required.

The NPDES Construction General Permit requirements involve: (1) the filing of a Notice of Intent that identifies the general operator of the site and provides information about the site itself, (2) the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) with appropriate best management practices (BMPs) to minimize discharge of pollutants from the site, and (3) the submittal of a Notice of Termination when the site has achieved final stabilization or stormwater is no longer being discharged.

The NPDES Remediation General Permit requirements involve: (1) the filing of a Notice of Intent that identifies the general operator of the site and provides information about the site itself, including the quality of the groundwater and proposed treatment plan, (2) the operation and maintenance of a treatment system to manage polluted groundwater, and (3) the submittal of a Notice of Termination when groundwater is no longer being discharged.

During construction of the Project, approximately 15.1 acres of previously developed land are anticipated to be disturbed. US2 will file a Notice of Intent at least 14 calendar days prior to commencing earth-disturbing activities and implement a SWPPP as required in connection with Project construction.

1.5.2 State

1.5.2.1 Department of Environmental Protection – Sewer Connection Permit, Cross Connection Permit and Environmental Remediation

US2 will comply with all requirements of the Massachusetts Department of Environmental Protection (MassDEP), which is expected to include the issuance of a sewer connection permit and which may include a cross-connection permit and environmental remediation.

1.5.2.2 Department of Transportation – Chapter 40, Section 54A Approval

Under M.G.L Chapter 40 §54A, the Massachusetts Department of Transportation (MassDOT) requires the issuance of a Letter of Consent for construction on land formerly used as a railroad right-of-way. The application for consent will be submitted by the Somerville Inspectional Services Department, requesting a noticed public hearing pursuant to M.G.L. Chapter 40, Section 54A. Following the public hearing, MassDOT is expected to issue a letter stating its decision, addressed to the Somerville Inspectional Services Department and applicant. The process for obtaining required approvals under M.G.L Chapter 40 §54A is further discussed in Chapter 6 (see response to comment MEPA.13).

1.5.2.3 Massachusetts Historical Commission – State Register Review

Projects that require state licenses, permits and/or approvals, or utilizing state financing are subject to review by the Massachusetts Historical Commission (MHC) in accordance with M.G.L. Chapter 9, sections 26-27C, as amended by Chapter 254 of the Acts of 1988 (950 CMR 71.00). The

submission of the Environmental Notification Form to the MHC initiated State Register Review. MHC's comment letter on the DEIR stated that "MHC has determined that the proposed project will have 'no adverse effect'".

1.5.2.4 Massachusetts Water Resources Authority – Temporary Construction Dewatering Permit and Industrial Use Discharge Permit

In accordance with 360 CMR §§10.091 through 10.094, the Massachusetts Water Resources Authority (MWRA) requires a permit for the Temporary Discharge of Construction Site Dewatering Drainage. US2 will provide the MWRA with a Temporary Construction Dewatering Discharge Permit application at least 30 days prior to construction.

The Project will comply with all requirements of the MWRA, which may include issuance of a Sewage Use Discharge Permit in accordance with Title 40 of the Code of Federal Regulations Part 403, Section 403.14 and M.G.L. c.21 and 27. US2 will submit a complete permit application prior to the anticipated date of initial discharge.

1.5.2.5 Department of Housing and Community Development - Approvals under Master Land Disposition Agreement (D2) and Land Disposition Agreements (other Lots)

The Project will comply with all requirements respecting Department of Housing and Community Development approvals of the SRA conveyances of D2 property under the MLDA, and of any future SRA conveyances under Land Disposition Agreements respecting other Lots, as applicable.

1.5.3 Local

1.5.3.1 Somerville Planning Board – Coordinated Development Special Permit and Design and Site Plan Review Approval

The Somerville Planning Board has issued a Coordinated Development Special Permit with respect to the Project. The Project will comply with all requirements of the Somerville Planning Board respecting DSPR for each Lot within the Project.

1.5.3.2 Somerville Fire Department - Permits and Approvals for Fuel Storage, Fire Safety Equipment, Alarm System, Sprinkler, Standpipe, Smoke Control and Hydrant

The Project will comply with all requirements of the Somerville Fire Department, which are expected to include permits and approvals for fuel storage, fire safety equipment, alarm systems, sprinklers, standpipes, smoke control and hydrants.

1.5.3.3 Somerville Inspectional Services Department – Building Permit, Electrical and Gas Permits

The Project will comply with all requirements of the Somerville Inspectional Service Department, which are expected to include building permits and electrical and gas permits.

1.5.3.4 Somerville Department of Public Works – Street Occupancy and Opening Permit

The Project will comply with all requirements of the Somerville Department of Public Works, which are expected to include street occupancy and opening permits, trench permits, street occupancy, alteration/encroachment/overhang, tieback retention system and sidewalk alteration permits, backflow preventer, hydrant, sewer connection, stormwater system and water permits, as well as permits and approvals for curb cuts, driveway opening/closing, street lighting, grants of location, and construction traffic management plan permits.

1.5.3.5 Somerville Redevelopment Authority – Land Acquisition, MLDA, Land Disposition Agreements and Certificates of Compliance

The SRA and US2 are parties to the MLDA, which sets terms for acquisition and redevelopment of the D Blocks and serves as the land disposition agreement with respect to D2, which is currently owned by the City/SRA. The MLDA also identifies the process for acquisition and development of the other D Blocks, including schedule commitments related to overall development and construction of individual projects. Pursuant to the MLDA, US2 must use good faith diligent efforts to privately acquire the parcels comprising subsequent phases of the Project and must keep the SRA apprised of these efforts on a quarterly basis. If despite US2's private negotiations it has not acquired a parcel in time to facilitate development of the applicable portion of the Project in accordance with the master Project schedule, US2 may request that the SRA initiate eminent domain, and the MLDA provides for the SRA to then take such parcel by eminent domain and convey it to US2 (or its affiliate).

The MLDA further provides for US2 (or the applicable parcel developer, which may be a US2 affiliate) to enter into a land disposition agreement with the SRA with respect to development of the applicable property following its acquisition. The individual land disposition agreements respecting subsequent phases are to also govern development of the parcels acquired thereunder. The Project will comply with all requirements of the MLDA respecting acquisition of individual parcels, as well as all requirements for issuance of certificates of compliance.

1.5.3.6 Somerville Director of Transportation and Infrastructure – Mobility Management Plan

The Project will implement a mobility management plan that will serve to increase the attractiveness and practicality of other modes of transport, while reducing the demand for and use of cars. This Mobility Management Plan will be consistent with the City of Somerville Zoning Ordinance, which requires sophisticated Transportation Demand Management mechanisms. US2, as a condition of occupancy, will present strategic plans for demand management tools and an implementation schedule of the same.

1.5.3.7 Somerville Office of Strategic Planning and Community Development, Housing Division – Affordable Housing Implementation Plan

The Project will comply with all requirements of the Somerville Office of Strategic Planning and Community Development, Housing Division, which are expected to include entering into an affordable housing implementation plan for each building that includes affordable housing units.

1.6 Permitting and Review Process

The Union Square Zoning that was approved by the Somerville Board of Alderman in June 2017 outlined a two-step permitting process for the Project: (1) a CDSP; and then (2) DSPR for each individual building project, civic open space and thoroughfare.

As described in the DEIR, the initial stage of this local zoning process, involving application for and issuance of a CDSP (a master project approval), was completed when the Planning Board of the City issued a CDSP (as well as three additional special permits and two waivers) pursuant to a unanimous written decision dated December 15, 2017. This decision was filed with the Clerk of the City of Somerville on December 28, 2017 and recorded with the Middlesex South Registry District of the Land Court as Document No. 201801781416. The CDSP process included extensive public review and comment, and review by City staff and elected and appointed officials. The CDSP was the first of its kind in Somerville and outlined a multi-lot development strategy for the D Blocks that focused on an overall vision, zoning compliance, preliminary phasing, and the distribution of 2.4 million square of program area and 2.5 acres of required open space across the development site that would jointly deliver on long-awaited community goals. The CDSP codified massing and organization of uses on individual Blocks, through the block and lot diagrams that conceptually divided Blocks into building lots, civic open space lots and thoroughfares.

DSPR is the second of the two-step permitting process required by the Union Square Zoning in which a more detailed design and site plan for each building lot, civic open space lot and thoroughfare project as identified in the CDSP is further reviewed by the Planning Board. The DSPR process is itself a five-step review, requiring the applicant to address both discretionary and administrative review procedures. In sequence these steps, in concert with their respective goals, are as follows:

1. Pre-submittal meeting: Preview content, logistics, and approach with City staff.

2. Neighborhood Meeting #1: Share planning progress and alternative design directions to encourage community participation and feedback.

3. Design Review Meeting: Solicit Design Review Committee feedback on design direction and design guideline conformance.

4. Neighborhood Meeting #2: Share more detailed planning progress to encourage community participation and feedback.

a. Application formally submitted for Planning Board review.

5. Planning Board Hearing: Administrative review process to determine compliance with standards, CDSP, and zoning.

The procedure is designed to ensure public input is received at each step in the application process, but most importantly, it achieves this feedback early in the design process at a time when it can more efficiently effect change. The common 'touch points' between the community and design professionals results in a design feedback loop that is intended to ensure a final application inclusive of community perspective, when finally submitted.

Each future civic open space, thoroughfare or building project will complete the same DSPR process. Prior to starting the DSPR process for each individual project, US2 is required to demonstrate land control of the property related to that Project component, and US2 will do additional diligence related to existing conditions, including soil contamination, if any. As part of the DSPR process and application, US2 will be providing additional information including a survey of existing conditions and proposed conditions, plans that outline the proposed development and a copy of soil contamination reports, if any, prepared for the property. If any soil contamination reports identify conditions that require clean-up in order to implement the proposed development, US2 will pursue any required environmental approvals through the appropriate regulatory processes. US2 will make additional public disclosures related to soil contamination as required by the regulatory process.

Since the DEIR was filed, US2 has continued with the local municipal zoning and permitting process relating to the D2 portion of the Project (i.e., DSPR), concurrently with the MEPA process.

D2 is the only portion of the overall Project that has initiated the DSPR process. US2 has completed the first several steps in that process, including completing a required pre-submittal meeting, an initial required neighborhood meeting, a required design review meeting, an additional required neighborhood meeting, and the filing of DSPR applications for each of the various proposed components of the initial phase of development on D2. The next stage of this process, which will involve several public hearings before the Planning Board and multiple opportunities for public input and input from various governmental agencies, is currently ongoing.

Additional details about the public processes and approvals that pre-dated the approval of the Union Square Zoning are outlined in Attachment 2, Section 3 of the ENF, including the community process that started with the development of *SomerVision* through the approval of the Union Square Zoning.

Traffic and Transportation

2.0 TRAFFIC AND TRANSPORTATION

As requested in the DEIR Certificate, this chapter includes additional information regarding the Pedestrian Level of Service analysis methodology, intersection safety, shared parking analysis, transit analysis, metrics for potential transportation mitigation, and a revised traffic monitoring plan.

2.1 Pedestrian Level of Service Analysis Methodology

As requested in the DEIR Certificate, this section describes the Pedestrian Level of Service (PLOS) analysis included in the DEIR. The pedestrian analysis (included in Section 4.5.2 of the DEIR) investigates existing pedestrian activity at key locations across the study area. These locations are analyzed for the pedestrian delay at crosswalks in terms of the PLOS, which measures the expected delay for pedestrians attempting to cross the street. Essentially this methodology determines the amount of time in seconds a pedestrian can expect to wait before being able to safely cross a roadway.

The methodology used to determine the PLOS analysis included in the DEIR is directly from the Highway Capacity Manual 2010 (HCM) published by the Transportation Research Board (TRB). The PLOS for signalized intersections follows the methodology detailed in Chapter 18 of the HCM, and the PLOS for unsignalized intersections follows the methodology detailed in Chapter 19 of the HCM. These methodologies are industry standards supported by years of research by TRB. The following sections detail the steps required to determine the PLOS for each type of intersection based on the HCM methodology.

Signalized Intersection Methodology

A summary of the methodology for signalized intersections is included below. The full methodology with all equations can be found in Volume 3 of the HCM on pages 18-68 to 18-70. The table used to determine the PLOS ranges is on HCM page 18-7 in Exhibit 18-5.

In determining the PLOS score, the following four Factors are calculated and then combined for each crosswalk. The Factors are:

- Fw = Cross Section Adjustment Factor

  (Based on the number of lanes that a pedestrian must traverse while crossing the road)

- Fv = Motorized Vehicle Volume Adjustment Factor

  (Based on the number of vehicles that conflict with the pedestrian movement during the peak hour)

- Fs = Motorized Vehicle Speed Adjustment Factor

(Based on the 85th percentile speed of the roadway being crossed)

- Fdelay = Pedestrian Delay Adjustment Factor

  (Based on the pedestrian delay which is calculated using the signal timing for the intersection)

The Factors determine the impact that each aspect has on the overall delay and provides a unitless value for the score. The Factors return weighted values, based on the importance of each variable to the overall PLOS, based on numerous studies by or for TRB.

Once a crosswalk at an intersection is evaluated, the resulting PLOS score is then compared with the thresholds found in HCM Exhibit 18-5 on Page 18-7 and shown in Table 2-1. PLOS A represents the highest freedom of movement for pedestrians while PLOS F represents the lowest level of service for pedestrians.

Table 2-1 PLOS Methodology

PLOS	PLOS Score
A	≥2.00
B	>2.00-2.75
C	>2.75-3.50
D	>3.50-4.25
E	>4.25-5.00
F	>5.00

As part of the PLOS analysis, the minimum pedestrian interval times for each intersection were used in the calculations for pedestrian walk times. While some of the walk times are below the MUTCD recommended interval length, it should be noted that the walk time is a minor factor in the overall calculation of the PLOS and that existing walk timings were provided by the City. Adjusting the walk times to the maximum pedestrian interval length at each intersection produced no significant changes in the overall PLOS scores and did not affect the PLOS of the intersections.

Unsignalized Intersection Methodology

A summary of the methodology for unsignalized intersections is included below. The full methodology can be found in Volume 3 of the HCM on pages 19-30 to 19-36. The table used to determine the PLOS ranges is on Page HCM 19-2 in Exhibit 19-2.

Unsignalized intersection PLOS methodology follows several steps to determine the delay in seconds per pedestrian (s/ped).

Step 1: Identify Two-Stage Crossings

A two-stage crossing is classified as any crossing with a raised median that can act as a refuge or waiting area for pedestrians. There are several intersections in the study area, including Somerville Avenue/Washington Street, Somerville Avenue/Warren Avenue and Somerville Avenue/Bow Street that have a refuge area. However due to the traffic signal operations and geometric layout of these intersections, none of the crossings were identified as a two-stage crossing for the purpose of a PLOS analysis.

Step 2: Determine Critical Headway

Critical headway, which is the time in seconds below which a pedestrian will not attempt to begin crossing the street, is calculated for an individual pedestrian and then used to determine the critical headway for a group of pedestrians.

Step 3: Estimate Probability of Delayed Crossing

Probability of delayed crossing determines the probability of a pedestrian coming to a crosswalk and being unable to cross immediately.

Step 4: Calculate Average Delay to Wait for Adequate Gap

Initially, this determines the delay experienced by each pedestrian and then, using the Probability of Delay, the average delay is calculated.

Step 5: Estimate Delay Reduction due to Yielding Vehicles

This step was skipped in order to provide a conservative PLOS analysis since this would result in the delay being reduced.

Step 6: Calculate Average Pedestrian Delay and Determine PLOS

Each crosswalk at an intersection is evaluated separately to calculate a PLOS score which is then compared with the thresholds found in Exhibit 19-2 on Page 19-2 and shown in Table 2-2.

Table 2-2 PLOS Methodology

LOS	Control Delay (s/ped)	Comments
A	0-5	Usually no conflicting traffic
B	5-10	Occasionally some delay due to conflicting traffic
C	10-20	Delay noticeable to pedestrians, but not inconveniencing
D	20-30	Delay noticeable and irritating, increased likelihood of risk taking
E	30-45	Delay approaches tolerance levels, risk-taking behavior likely
F	>45	Delay exceeds tolerance level, high likelihood of pedestrian risk taking

2.2 Intersection Safety

Additional information was requested by the DEIR Certificate regarding the need for, and appropriateness of, mitigation measures to correct safety-related deficiencies at a limited number of study area intersections based on consultation with MassDOT and the City.

Building on the descriptions and analysis in the DEIR, and as stated in MassDOT's comment letter, *"There are several Highway Safety Improvement Program (HSIP)-eligible study area intersections and roadway segments ... (which) have been the subject of projects to improve vehicular, pedestrian and bicycle safety in recent years ..., and as such, we do not require that Road Safety Audits (RSA's) be conducted for these intersections."*

Three additional intersections were identified as having crash rates above the MassDOT statewide and District 4 averages for the three-year period between August 2014 and August 2017. These intersections are:

- Webster Avenue/Tremont Street/Columbia Street;
- Beacon Street/Concord Avenue; and
- Beacon Street/Washington Street.

While the intersections listed above are in the Project's expanded study area, it should be noted that none are proximate to any of the Blocks comprising the Project, and all see minimal change in operations due to Project-related impacts. Moreover, US2 has met with the City to review each of these locations, and the City is already undertaking planning and design for safety (and other) improvements at each of these locations, including engaging with MassDOT for each as indicated. This approach was discussed with MassDOT and the City at a meeting on April 17, 2019. The nature of each is described below.

- Webster Avenue/Tremont Street/Columbia Street

  In 2018, the City installed a series of low-cost safety improvements along Webster Avenue, including at the intersection of Webster Avenue/Tremont Street/Columbia Street. These safety treatments included elimination of on-street parking to improve sight lines, installation of protected bike lanes physically separated from motor vehicle traffic, and installation of a high-visibility mid-block crosswalk. Ongoing monitoring of safety conditions will be performed by the City, including new motor vehicle counts for volume and speed, annual counts for bicycle and pedestrian traffic, and ongoing crash reporting. The ongoing monitoring data will inform the eventual reconstruction of Webster Avenue's streetscape.

- Beacon Street/Concord Avenue

  In 2019, MassDOT will complete its Beacon Street Reconstruction project, which includes the intersection of Beacon Street at Concord Avenue. New ADA-compliant sidewalks and curb ramps will be provided at this location, along with enhanced crosswalk markings and signage. High-friction, high-visibility green bike lane markings will be installed on-street, effectively narrowing motor vehicle travel lanes and serving as a traffic calming measure. The City will perform post-installation safety monitoring at this location, collect new motor vehicle counts for volume and speed, annual counts for bicycle and pedestrian traffic, and ongoing crash report data.

- Beacon Street/Washington Street

  In 2019, MassDOT will complete its Beacon Street Reconstruction project, which includes the intersection of Beacon Street at Washington Street. New ADA-compliant sidewalks and curb ramps will be provided at this location, along with large pedestrian bump-outs to reduce crossing distances and reduce speeds of turning motor vehicles. New on-street bike lanes are being installed using high-visibility, high-friction pavement markings materials; these markings include bike boxes and two-stage turning queue boxes. New traffic signal equipment is being installed, including camera detection, allowing for greater flexibility in timing patterns responsive to changing travel patterns.

US2 supports the City's efforts at each of these locations, and the City has been able to use the base multimodal transportation information and analysis prepared by US2 as part of the Project's Transportation Impact Assessment (TIA) to advance the planning and design at each of these locations. Safety improvements will also be consistent with the City and MassDOT's Complete Streets policies. The City, with the support of US2, will continue to monitor these locations and may implement additional modifications as determined.

The City is currently preparing a citywide "Vision Zero Action Plan", which will serve as a strategic framework for eliminating crashes that result in severe injury and fatality. The draft plan recommends establishment of a "rapid response / short-term implementation" program for quick deployment of traffic calming and multi-modal safety investments. The City is currently investigating funding options for such a program and the Project's designated rapid response transportation mitigation funds are intended to provide support for this program. Criteria for deployment of resources under this program will also be articulated through the community-based Vision Zero Action Plan process; key performance indicators may include crash frequency and severity, documented near-miss incidents, and changes to motor vehicle volumes and speeds.

Moreover, the transportation monitoring program required by the Mobility Management Plan agreements between US2 and the City require the identification of safety-related deficiencies at monitored intersections along with other data to be collected. US2 will continue to support the City's efforts to address safety-related deficiencies if they occur in the future along with other transportation components as the study area continues to evolve.

2.3 Shared Commercial Parking

As requested by the DEIR Certificate, this section describes the shared parking model used to determine the proposed number of parking spaces, and how commercial parking will be managed.

2.3.1 Basis for Analysis

The basis of the parking demand model used by US2 to evaluate the shared parking strategy described in the DEIR has been under development with, by, and for the City through multiple planning processes governing the future of Union Square. A summary of these processes with relevant references is incorporated below.

Union Square Neighborhood Plan (2016)

The original analysis and concept for the Shared Parking Model was developed through the Neighborhood Plan. The Shared Parking Model included a review of potential land use for the entire Neighborhood Plan area, which extended well beyond the D Blocks. It further explored factors to be applied that would reduce overall parking demand and placed them within a Union Square context. An excerpt from Appendix B of the Neighborhood Plan which describes this evaluation is included as Appendix D1. This process is summarized below within the Coordinated Development Special Permit (2017) section.

Union Square Zoning (2017)

The recently adopted Union Square Zoning Overlay District includes a carefully considered parking policy that requires a shared parking strategy, permits a maximum of 1,500 total parking spaces, and has no required parking minimum ratios. The Project and its transportation demand management (TDM) approach is responsive to this policy and includes approximately 1,495 proposed parking spaces. The proposed number of parking spaces is based on developing a mix of Project uses, operating shared parking facilities and the parking management strategy outlined in the DEIR (see Section 4.5.6 of the DEIR).

Coordinated Development Special Permit (2017)

The Parking Demand Model was further developed and included in the Mobility Management Plan component of the Project's CDSP application submitted to the City on September 18, 2017. The relevant pages of the Mobility Management Plan, which describe the assumptions included in the Shared Parking Model, are incorporated as Appendix D2. In addition to describing the parking plan for the Project, the CDSP included an analysis using the Shared Parking Model, which stated, *"The estimated peak demand for the Union Square development is approximately 1,454 vehicles at midday."*

The goals and methodology of the Shared Parking Model, as described in the Mobility Management Plan (provided as Appendix D2), are summarized as follows:

The Union Square Redevelopment seeks to provide parking that serves the proposed development and adjacent neighborhood without incentivizing driving and is as efficiently utilized as possible in order to meet the goals of the Union Square Neighborhood Plan.

Estimates of parking demand used the detailed model developed specifically for Union Square as part of the Union Square Neighborhood Plan. Based on Union Square's mixed use and accessible context, the team used an adapted shared parking model based on the Urban Land Institute's (ULI) Shared Parking Manual (2nd Edition, 2005) and the Institute for Transportation Engineers (ITE's) Parking Generation (4th Edition, 2010) to model demand. The model is based on the most current [development] program, provided below.

Apartments	*998 units*
Hotel	*175 rooms*
Retail	*123,000 sf*
Office	*1,158,000 sf*
ACE	*54,000 sf*

The parking demand model includes the following inputs:

- *Land use in Union Square*
- *Shared use by time of day*
- *Context variables, including:*
  - *Mode shares in Union Square*
  - *Internal capture (trips that access multiple uses without generating additional parking demand, i.e., walking from a residence to a coffee shop, or from the office to a restaurant)*
  - *TDM program impacts*

The model assumes the following parking use reductions, shown on Table 2-3.

Table 2-3 Contextual Reductions in Parking Demand

Reduction	% Reduction	Union Square Context
Captive Market Effect: Commercial	32	Union Square has an excellent mix of uses, ranging from retail to office to residential. This will only improve in the future. Thus, this model input set internal capture to the maximum.
Captive Market Effect: Residential	31	
Employee TDM Impact	24	Union Square's accessibility by a mix of modes currently serves as excellent TDM for employees and residents alike. This will only improve in the future – thus the model set this input to the maximum.
Residential TDM Impact	30	Living in Union Square does not guarantee one a dedicated parking space. This has shown to reduce parking demand by residents.
Transit Access Impact on Retail	8	Union Square is currently well served by MBTA bus service and will have high-quality Green Line service. Thus, this model input set internal capture to the maximum.
Office Employee Mode Adjustment	35	In the future, Union Square will have both paid parking and high-quality transit service.
Employee Parking Share (non-office)	20	Employees respond differently to transportation context changes as they commute in similar patterns daily. Thus, it is important to distinguish this group from customers at non-office uses. This was assumed to be consistent across uses.
Office Visitor Parking Share	4	Visitor parking demand at offices is similarly broken out by the model as influenced by different factors than regular commuters. As the proportion of visitors to different offices varies, this number was varied across scenarios.

Note: See Appendix D2, Table 2 for source of data

The parking demand estimates are provided below by use:

- ***Employee:*** *The model assumes that at peak, the parking demand by employees at the office use will be 995 vehicles at midday. There will be additional parking for retail employees, which is assumed to be 20% of peak parking demand for the hotel and retail, or a peak of approximately 50 employees at midday.*

- ***Resident:*** *Residential peak demand would occur at midnight, with approximately 570 parked vehicles.*

- ***Short- and long-term visitor parking demand:*** *This demand is included in the parking generation rates by use. We note further that any proposed retail space will be primarily local servicing with limited demand or use of parking facilities.*

City of Somerville Parking Demand Model and Design and Site Plan Review (ongoing)

The City developed the Shared Parking Model in 2018 into a formal calculation process which incorporates much of the analysis and factors traceable through previous efforts. This calculation is required to be submitted as a component of the Mobility Management Plan for each of the Project's Lots in the City's DSPR process. The City's Shared Parking Model includes reductions in expected parking demand due to contextual factors such as captive market effects, transportation demand management programs and transit access. For reference, a completed calculation for the overall Project using this tool is included as Appendix D3.

2.3.2 Commercial Parking Facilities

Although the Project is currently anticipated to be developed in phases as described in Section 1.2.3, parking supply will be provided by Lot as described in Section 1.2.3. As required by Union Square Zoning and codified in the CDSP, all commercial parking will be shared among Project uses. All commercial parking, as it is built out, will be gate controlled, with vehicle access via ticketing or reader card systems. The parking plan includes the following steps to manage commercial parking:

- **Parking Management.** The commercial parking garages will be managed by the property owner or a management agency independent from other non-residential uses per the Project's approved Mobility Management Plan.

- **"Unbundled" Parking.** All residents and employers at the Project site must purchase and/or lease parking separately from any office and/or residential space. This strategy ensures that users understand the true cost of parking provision and can make transportation choices accordingly. It also creates more affordable commercial space and housing by allowing parking to become an optional amenity rather than a required purchase.

- **Market Rate Pricing.** Parking will be available at local market rates. Parking pricing is one of the most effective tools to balance demand and encourage people to travel using more cost-effective modes such as transit, walking, and/or bicycling.

- **Daily Pricing.** When practical and feasible, daily parking will be available at daily rates rather than monthly leases. When users pay for parking each day, they are reminded of its cost which encourages choosing other modes. Moreover, avoiding monthly leases helps to avoid the mentality that parking is a "sunk cost" and instead encourages flexibility in travel options.

- **Real-Time Availability.** The Commercial Service Vehicular Parking Facility will provide a sign at the vehicle entrance indicating the number of spaces available in real time, per the Project's approved Mobility Management Plan.

- **Reserved Spaces.** A limited number of residents will be able to lease reserved spaces within the Commercial Services Vehicular Parking Facility. A limited maximum number of parking spaces will be reserved for residents within the Commercial Services Vehicular Parking Facility, to be managed by the Lot's Transportation Coordinator.

2.4 Transportation Mitigation

2.4.1 Introduction

This section summarizes the transportation mitigation to be provided by the Project, consistent with and derived from the City's recently completed Neighborhood Plan and previous Project agreements.

The Project is committed to achieving its mode share goals of 60% non-auto travel, consistent with permitting agreements and larger neighborhood and City goals. As Project implementation work has proceeded, including in response to the comments on the DEIR, the Project has met with the City to reaffirm the commitment to support the City's efforts to consistently monitor and balance the transportation network and the Project's TDM programs to achieve the Neighborhood Plan's and City's vision. The Mobility Management Program and monitoring requirements, as codified in Project permitting documents, are the foundation of the Project's transportation mitigation.

To advance these mode share and other community goals, US2 has committed to contribute financial resources to the City for their use in mitigating Project transportation impacts as follows:

- Transit Expansion: $5.8 million to the City to offset their contribution to the GLX project.

- Planned Complete Streets Improvements: $4.6 million in offsite infrastructure contributions that will defray the cost of certain offsite infrastructure improvements to be made by the City. These planned infrastructure improvements are further described in Section 1.4 and include the improvement of neighborhood streets to a Complete Streets design as envisioned in the Neighborhood Plan as well as utility improvements.

- Future Mitigation: $3.4 million in future phase contributions that can be used at the City's discretion to address future transit, transportation infrastructure or community needs. As part of US2's negotiations with the City regarding mitigation contributions, the parties specifically agreed to a "Future Phase" contribution that could be used by the City to address future Project needs that are unknown today. The financial contributions can be directed to projects or programs at the City's and/or community's discretion based on local priorities. The general fund contributions are in place of specific mitigation measures directly related to impacts, allowing the City flexibility to determine what measures are necessary or warranted.

  Based on ongoing discussions with City staff, and the terms of agreements with the City related to the contributions, the City may utilize all or a portion of these funds, as it determines appropriate, for additional transportation mitigation measures as necessary. Through this approach, the City can determine the success of measures it has already implemented and determine what measures (if any) would best meet their goals, such as signal timing, roadway restriping, new signals, or other measures.

- Anticipated Short-Term Mobility and Safety Mitigation: $0.4 million in rapid response transportation mitigation funds are dedicated to be used for rapid-response mobility and safety retrofits in the Project area. This is a portion of the infrastructure and future phase contributions that have been designated for this purpose and that have been excluded from the values noted above.

2.4.2 Transit Improvements

US2 is committed to working with all parties, including the City and the MBTA, to ensure transit access to Union Square as part of larger overall goals of minimizing auto travel and meeting or exceeding mobility management requirements. While the MBTA controls improvements to their system, US2 has committed to providing the following in support of Union Square Station:

- Creation of a plaza that includes an Americans with Disabilities Act (ADA) compliant path from the station platform north to the Prospect Street sidewalk at Bennett Street.

- Construction of an employee lounge, janitor closet and restrooms for MBTA employees.

- Provision for a drop-off area on the Project property for The Ride, the MBTA's paratransit service.

- Provision of 90 sheltered and secured bicycle parking spaces and racks for 30 bicycles.

- More recently, after the LOI was executed and as part of continued coordination, US2 agreed to allow the MBTA to connect to a proposed water main on the D2 site so that water service could be provided to the station area. This connection significantly shortens the required length of the MBTA's water main and reduces the MBTA's expense for this service.

- Continued coordination with the City, MBTA and GLX project team to identify a solution for the MBTA elevator at Union Square Station. US2 has offered to provide land area on D2 to make way for the MBTA elevator solution and/or install a stair adjacent to the MBTA elevator location. US2 has also offered to contribute to a portion of the cost of the MBTA elevator.

In addition to the physical improvements, US2 also agreed to the following to support the GLX project:

- Fund $5.8 million to the City to help offset the City's financial commitment to the GLX project.

- Convey a permanent easement to the MBTA across the portion of D2 that includes the station area so the MBTA can construct, operate, maintain, repair and replace the GLX. US2 will purchase the entire D2 Block from the SRA and will provide the easement at no cost to the MBTA. Figure 1-3 is a conceptual diagram of the easement areas. The parties are in the process of finalizing the easement locations and documenting easement agreements.

- Work with MBTA, GLX project team and City to provide the construction easements necessary to construct the MBTA station and simultaneously provide for construction of the D2 buildings and the related station improvements.

The latest D2 site plan, Figure 1-21, depicts how the station design and D2 design interrelate, and identifies each of the station supporting improvements provided by US2.

2.4.3 Bicycle Improvements

With financial support from US2, the City will construct raised protected bicycle lanes on Somerville Avenue. Moreover, the Project is committed to encouraging bicycle use as part of its ongoing TDM programs included in the Mobility Management Plans to be executed with the City. TDM programs will include commitments to provide incentives for bicycle use and the provision of:

- Approximately 1,750 bicycle spaces for short-term and long-term stays to be delivered on a building-by-building basis. More than 550 of these spaces will be on D2 adjacent to the Union Square Station area.

- 90 sheltered and secured bicycle spaces adjacent to Union Square Station within a fully-accessible enclosure to be lit and protected by fire alarm, camera, and communication coverage.

- Bicycle racks for an additional 30 bikes immediately adjacent to the Union Square Station entrance.

- At least two bike share stations and the associated bicycles in line with Project buildout agreements.

The City has already committed to significant bicycle improvements described above, with support from US2, and will continue to include bicycle accommodations in future area roadway designs. In 2017 and 2018, the City installed its first protected bike facilities (Washington Street, Webster Avenue, Prospect Street and Beacon Street) and these treatments will be replicated wherever possible to increase comfort and safety for bicycle riders of all ages and abilities. Somerville Avenue is scheduled to receive approximately 1,800 feet of dedicated, separated cycle tracks on both sides of the street prior to the complete construction of the Project.

2.4.4 Pedestrian Improvements

The Project will increase sidewalk space by setting buildings back to allow sidewalks with a minimum of 12 feet width along all zoning-defined 'Pedestrian Streets' (Somerville Avenue, Washington Street, Prospect Street, Bow Street and Webster Street). These expanded sidewalks will significantly improve the existing conditions for pedestrians and provide a generous pedestrian access network among existing and future neighborhood nodes. Pedestrian access is further supported by approximately 113,600 sf of high-quality civic open spaces that serve as extensions of the public realm and provide pedestrian-prioritized connectivity to neighborhood opportunities (see Section 1.2.4 for more information about the Project's civic open spaces). These include:

- A master plan that creates through-block connectivity on the larger D Blocks, which will encourage walking and biking by providing short, direct connections.
- A pedestrian plaza, providing at grade, ADA access to the future Union Square Station.
- Continuous expanded sidewalks of 12 feet minimum width along Blocks with building frontages on designated 'Pedestrian Streets' to be supported by street furniture, plantings, and new, urban tree canopy which include:
  - Somerville Avenue: D1, D2, and D6;
  - Prospect Street: D2, D3, D4, and D6;
  - Washington Street: D1 and D5;
  - Bow Street: D7; and
  - Webster Avenue: D3 and D4.
- An approximately 27,000 sf Neighborhood Park on D1, a location approximately equidistant from Union Square Station and Washington Street Station.

- A through-block pedestrian connection at D6, supported by active ground floor uses, to introduce a new, alternative path to and from Union Square Plaza.

- A portion of Newton Street along D4.3 is planned to be improved as a pedestrian only civic open space that follows a pedestrian desire line identified by community members.

2.5 Metrics to Identify Potential Transportation Improvements

2.5.1 Introduction

The DEIR Certificate requested that specific metrics be identified that would indicate the need to consider modifications to the transportation network as the area evolves, and to identify potential interventions by mode.

As described in the DEIR and Section 1.4 of the FEIR, in addition to the transportation improvements to be funded or constructed by the Project, many additional improvements in the Union Square transportation network, which build on the Neighborhood Plan, have been identified and committed to by the City. See Appendix D4 for an excerpt from the Neighborhood Plan which describes the City's conceptual infrastructure plans for neighborhood streets. See Section 1.4 for additional information regarding the City infrastructure program. Of these improvements, the City has targeted the following:

- In 2019, the City will continue its data collection efforts on traffic signal operations at Prospect Street/Webster Avenue; Prospect Street/Somerville Avenue and Webster Avenue/Washington Street. Potential signal timing modifications and pavement markings modifications will be evaluated and implemented based on the ongoing data collection process.

- Between 2019 and 2021, the City will evaluate and implement pavement markings modifications on Washington Street between Beacon Street and Webster Avenue, to better serve bus mobility, pedestrian/bicycle safety and traffic calming objectives.

- In 2021, the City is expected to complete its Somerville Avenue Utility and Streetscape Improvements project, which will provide bus priority treatments, pedestrian safety measures and protected bicycle facilities between Prospect Street and Medford Street.

- In 2019 and 2021 the City is expected to begin design and engineering work for additional streetscape reconstruction consistent with the Neighborhood Plan's objectives for providing two-way traffic patterns on Somerville Avenue between Church Street and Bow Street/Warren Avenue.

Many of these anticipated City transportation improvements are not finally designed, so their effectiveness in further mitigating potential future transportation impacts cannot be fully known. As such, US2 will continue to evaluate the transportation network through its monitoring program to help the City determine what additional mitigation measures may be appropriate.

In any case, US2 and City understand that additional transportation-related modifications may be necessary as the neighborhood and the transportation systems evolve. The City has taken direct responsibility for completing transportation infrastructure changes, including making necessary priority determinations by mode, following the then current neighborhood, City and MassDOT planning and design guidelines. Throughout this ongoing process, US2 is committed to working with the City to:

- Implement the Project's transportation demand management programs;
- Direct support and data (through its monitoring program) to inform ongoing modifications;
- Coordination with the City on proposed improvements and their integration with the Project; and
- Provide the following financial resources aimed at supporting future transportation mitigation:
    - $3.4 million in future phase contributions that can be used at the City's discretion to address future transit, infrastructure or community needs. As part of US2's negotiations with the City regarding mitigation contributions, the parties specifically agreed to a "Future Phase" contribution that could be used by the City to address future Project needs that are unknown today. The financial contributions can be directed to projects or programs at the City's and/or community's discretion based on local priorities. The general fund contributions are in place of specific mitigation measures directly related to impacts, allowing the City flexibility to determine what measures are necessary or warranted.

      Based on ongoing discussions with City staff, and the terms of agreements with the City related to the contributions, the City may utilize all or a portion of these funds, as it determines appropriate, for additional transportation mitigation measures as necessary. Through this approach, the City can determine the success of measures it has already implemented and determine what measures (if any) would best meet their goals, such as signal timing, roadway restriping, new signals or other measures.
    - $0.4 million in rapid response transportation mitigation funds to specifically be used for rapid-response mobility retrofits in the Project area (e.g., traffic calming or multi-modal safety investments).

It should also be noted that transportation improvements such as right-of-way allocation, traffic signal timing or phasing, and others will continually involve balancing tradeoffs between modes based on the City's performance goals. For example, adding a protected bicycle lane may worsen traffic congestion due to the elimination of a travel lane, or adding pedestrian time to a traffic signal may slow buses as signal timing is altered.

2.5.2 *Potential Transportation Metrics*

As part of the proposed monitoring program, US2 and the City have discussed data metrics that can inform the need for modifications to the transportation network. A potential list of metrics, along with sources of data identified, is listed below, with the party anticipated to collect the data provided in parentheses:

- Crash frequency, documented near-miss incidents (Somerville Police Department, MassDOT, City of Somerville);
- Fatal or severe crash (Somerville Police Department, MassDOT, City of Somerville);
- Changes to motor vehicle volumes and speeds (City of Somerville and US2's vehicle counts);
- Non-achievement of Project's 60% non-auto mode share goal (US2's surveys);
- Substantive (>25%) annual growth in pedestrian volumes at a location (US2's pedestrian counts);
- Degradation in PLOS below PLOS D at an intersection or location with over 100 pedestrians an hour (City of Somerville and US2's monitoring);
- Change in bicycle level of stress (LTS) on a corridor (City of Somerville and US2's monitoring);
- Growth in bus ridership (>20%) at an individual location (MBTA data - Dashboard);
- Significant change in MBTA reliability or travel time in the Union Square area (MBTA data and coordination);
- Changes in MBTA route performance relative to the Route Comfort metric (MBTA, by request);
- Substantial (>10%) annual growth in roadway or intersection volumes (City of Somerville and US2's vehicle counts); or
- Significant and consistent change in observed vehicle queue or LOS for an approach (City of Somerville and US2's monitoring).

2.5.3 *Potential Transportation Improvements (by Mode)*

Notwithstanding the above descriptions and agreements with the City, as requested in the DEIR Certificate US2 has identified a number of potential transportation improvements which could be considered as the Project, neighborhood and City evolve. Demands and impacts on the multimodal transportation system will likely vary over time and US2 is committed to a consistent

multimodal monitoring program which will be developed on a Lot-by-Lot basis through ongoing City permitting processes. In this FEIR, and through ongoing coordination with the City and MassDOT, a number of potential improvements have been preliminarily identified for consideration as the area evolves, as provided below.

Potential General Improvements

- Traffic signal equipment upgrades.
- Updated traffic signal phasing and timing.
- Consideration of adaptive signal technology.
- Changes to street direction.
- Right-of-way allocation (pavement markings, etc.).
- Street and sidewalk design.
- Streetscape improvements.
- Signage.
- Re-striping or changes to roadway markings.
- Curbside regulations.
- Modifications to on-street parking location, management and pricing.

Transit Improvements

- Re-allocations to bus schedules to minimize runs which exceed the MBTA's max load capacity factor.
  - The Route 69, 83, 90, and 91 all have over 99% percent of passenger travel time experienced in comfortable conditions, per the MBTA's Comfort Metric, and are candidates for reduced service that could be re-allocated to other routes.
  - Add service to routes (80, 86, 87, and 88) that do not meet the MBTA's comfort metric standard.
- Redesign area bus routes to align with changing demands and service patterns.
- Identify and implement on-street transit improvements.
- Permanent installation of the temporary bus lane on Prospect Street northbound.

- Incorporation of Transit Signal Priority technology in all new and upgraded traffic signal installations.
- Consideration of a dedicated bus lane (peak hour or all day) on Washington Street.
- Consideration of a dedicated bus lane (peak hour or all day) on Central Broadway.
- Consideration of queue jumps at intersections through strategic design.
- Ongoing consideration of bus stop locations to improve operations and align with area buildout.
- Adding bump outs for bus stops, which would minimize bus dwell time and improve both speed and reliability – note that the City is in the process of designing these as part of its fully funded reconstruction of Somerville Avenue.
- Consideration of adding a queue jump, or limited, dedicated bus lane at the Beacon Street/Washington Street intersection as part of the City's ongoing safety improvements. The City has noted that Route 86 often experiences delays at this intersection and seeks to improve its operation and reliability here.

Potential Bicycle Improvements

- Finalization of Somerville Avenue separated cycle-tracks.
- Wayfinding and safety signage.
- Pavement markings.
- Street and sidewalk design.
- Traffic signal operations.
- Installation of new bicycle infrastructure as part of the Complete Streets program for other neighborhood streets that are part of the City's infrastructure program.

Potential Pedestrian Improvements

- Building setbacks to create additional sidewalk space.
- Completion of open space network as committed to in the CDSP.
- Wayfinding and safety signage.
- Pavement markings.
- Street and sidewalk design.

- Traffic signal operations.
- Installation of new pedestrian facilities.
- Potential individual improvements as noted in the DEIR (page 4-93), including:
    - Somerville Avenue at Washington / Prospect Street – Improved signal timing may be warranted to preserve pedestrian priority but should be balanced against vehicular and transit impacts.
    - Webster Avenue at Newton Street (unsignalized intersection) - Improved signage to encourage yielding could be considered.
    - Bow Street at Walnut Street (unsignalized intersection) – A new crosswalk may be evaluated for the crossing of Bow Street at this location.
    - Webster Avenue at Tremont Street / Columbia Street (unsignalized intersection that currently has no sidewalks) – As adjacent parcels develop, crosswalks and 'Yield to Pedestrian' signage may be considered in the future.
    - Bow Street at Warren Street - As part of the City's Union Square intersection redesign and Complete Streets program, the design of pedestrian routes at this intersection should be re-evaluated in the context of pedestrian volumes and accessibility.
    - Webster Street at Everett Avenue (unsignalized intersection with crosswalks across Everett Avenue and Webster Street) - Improved signage to encourage yielding to pedestrians may be considered.

MBTA Bus Service Mitigation

As part of the DEIR and at MassDOT's and MBTA's request, US2 completed a focused analysis of MBTA bus service using a new methodology developed by the joint MassDOT/MBTA Office of Performance Management and Innovation (OPMI). The emphasis of this analysis was to review the overall impacts of Project-generated trips, through the course of a day, relative to the Comfort Metric established through the MBTA's Service Delivery Policy.

The analysis evaluated all individual runs of the routes in the study area in all scenarios (Existing, No-Build, Build) to determine if, at any point in the route, the MBTA Service Delivery Policy max load factor would be exceeded. Combined, out of more than 800 overall daily runs, 16 runs exceeded the load factor in the Existing/No-Build scenarios at some point on the route, with only two of the exceedances occurring within the expanded study area. The Build analysis identified an additional 15 occurrences, with much of the impact concentrated on the Route 86, which:

- does not meet the MBTA Service Delivery Policy Comfort Metric (93.5% vs. 96%);

- has higher ridership and is currently more crowded than other routes; and
- has greater frequency, and thus was assigned proportionally higher Project-generated trips (per the methodology described in the Transit Analysis starting on page 4-118 in the DEIR).

Route 86 runs from Sullivan Square through Union Square and Harvard Square and ultimately to Chestnut Hill.

The DEIR further noted the conservative nature of the analysis (completed to show maximum potential impacts from the Project), and that:

- The analysis assumes the full build of the Project. The Project will be built out over time, and full impact will not be realized until full Project build-out.
- The analysis assumes the continuation of Existing Conditions for bus service, when the MBTA is currently undertaking several efforts, with City and Project coordination, to better provide area bus service, including making changes to the frequency, route and stops of the buses serving the Union Square area. These efforts include:
    - Better Bus project, the MBTA effort to review route-by-route changes to the bus network;
    - Bus Network Redesign – soon to be underway MassDOT/MBTA effort to redesign the overall bus network; and
    - Potential improvements to bus routes to coordinate service and minimize duplication once the GLX opens.

The DEIR comments requested that US2 identify potential interventions to improve MBTA bus service in the area to address existing and potential future crowding issues on the bus routes in the study area. Transit use is an important component of US2's ability to meet its mode share goals and mobility management requirements. As part of larger overall goals, the Project remains committed to working with all parties to ensure robust transit access to Union Square is provided, and has been and will continue to be supportive of the City's participation in ongoing planning, design and implementation efforts to improve transit operations, efficiency and capacity in the Union Square area. To that end, enumerated below are a number of potential bus service and infrastructure improvements to be considered as the Union Square area continues to evolve. Based on MassDOT feedback, improvements that benefit Route 86 are prioritized.

Minor re-allocations to bus schedules to minimize runs which exceed the MBTA's max load capacity factor.

As indicated above, the few runs that exceed the MBTA load factor are concentrated on certain routes during particular periods. During these same times, other MBTA bus runs are well below the MBTA's load factor. Adding just one or two runs to the routes that experience these exceedances would likely eliminate or minimize current deficiencies without creating unintended deficiencies on other routes. Of the routes in the study area, Routes 69, 83, 90, and 91 all have over 99% percent of passenger travel time experienced in comfortable conditions, per the MBTA's Comfort Metric. Note that the Service Delivery Policy sets a cumulative passenger comfort metric target of 96%. These routes may be the initial candidates for potential modifications of service to re-enforce the routes exceeding the load factor.

Currently, the MBTA has limited ability to add service to existing routes at key times, as the MBTA operates in a relatively constrained environment, with its resources essentially fully utilized at key times. Thus, adding service in one location typically involves a reduction or alteration of service somewhere else in the system. The recommendations published as part of the MBTA's Better Bus Project evaluate these tradeoffs and improvements throughout the MBTA system to accomplish larger overall goals and to balance service. The route-by-route recommendations developed by the Better Bus Project do not include specific interventions for any of the routes that directly serve the Union Square area.

Redesign area bus routes to align with changing demands and service patterns.

The DEIR identified two additional efforts that will examine or provide opportunities for substantive change in the pattern of MBTA bus service in the study area, as well as the Somerville MBTA service area. Each effort provides the opportunity to re-evaluate area bus service, including making changes to the frequency, route and stops of the buses serving the Union Square area. These efforts are:

- Bus Network Redesign – soon to be underway MassDOT/MBTA effort to redesign the overall bus network; and,
- Potential improvements to bus routes to coordinate service and minimize duplication once the GLX opens.

US2 will work proactively with the City and the MBTA on these efforts to ensure that potential improvements to MBTA service in the Union Square area are strongly considered. In response to DEIR comments, US2 has coordinated with the City to identify potential changes that should be evaluated. These changes include:

- Maximizing connections to Sullivan Square, which would help alleviate capacity issues on Route 86.

- Maximizing connections to MBTA Red Line stations, primarily at Kendall, Central, and Harvard stations, which would help alleviate capacity issues on Route 86.

- Minimizing duplication with Green Line service when the GLX opens, which could be accomplished by:

  - Elimination of Route 80, which parallels the College Avenue Green Line extension, or terminate Route 80 at one of the Green Line stations before Lechmere.

  - Terminate Route 87 at Union Square, rather than Lechmere.

  - Terminate Route 88 at Union Square or Washington Street Station, rather than Lechmere.

Changes to existing routes should occur in conjunction with or following the initiation of GLX service. The additional service time saved by these changes should be re-invested in local service, primarily Route 86, as determined to relieve overcrowding, increase frequency or provide additional connections in and around the Union Square area. It is the intention of US2 to work through these ongoing processes as much as possible to enhance area transit connections through improved MBTA service, rather than providing separate employee or Project shuttle service. However, provision of separate shuttle service is included as a potential measure that may be employed by US2 to meet mode share requirements under City permitting agreements.

Identify and implement on-street transit improvements.

The City has been at the forefront of recent regional investments in dedicated bus facilities. Evidence from several pilot and permanent installations has shown substantive travel time savings and reliability improvements. Unless time and reliability savings are re-invested in the route (e.g., increased frequency) the additional capacity created from on-street improvements to speed service is limited. US2 will continue to work with the City on ongoing roadway design and construction which balance the demands of all users, while finding ways to incorporate elements that specifically benefit bus service. Although the following list will continue to evolve, potential improvements being considered by the City and viewed favorably by US2 includes:

- Consideration of adding a queue jump, or limited, dedicated bus lane, at the Beacon Street/Washington Street intersection as part of the City's ongoing safety improvements. The City has noted that Route 86 often experiences delays at this intersection and seeks to improve its operation and reliability here.

- Permanent installation of the temporary bus lane on Prospect Street northbound.

- Incorporation of Transit Signal Priority technology in all new and upgraded traffic signal installations.

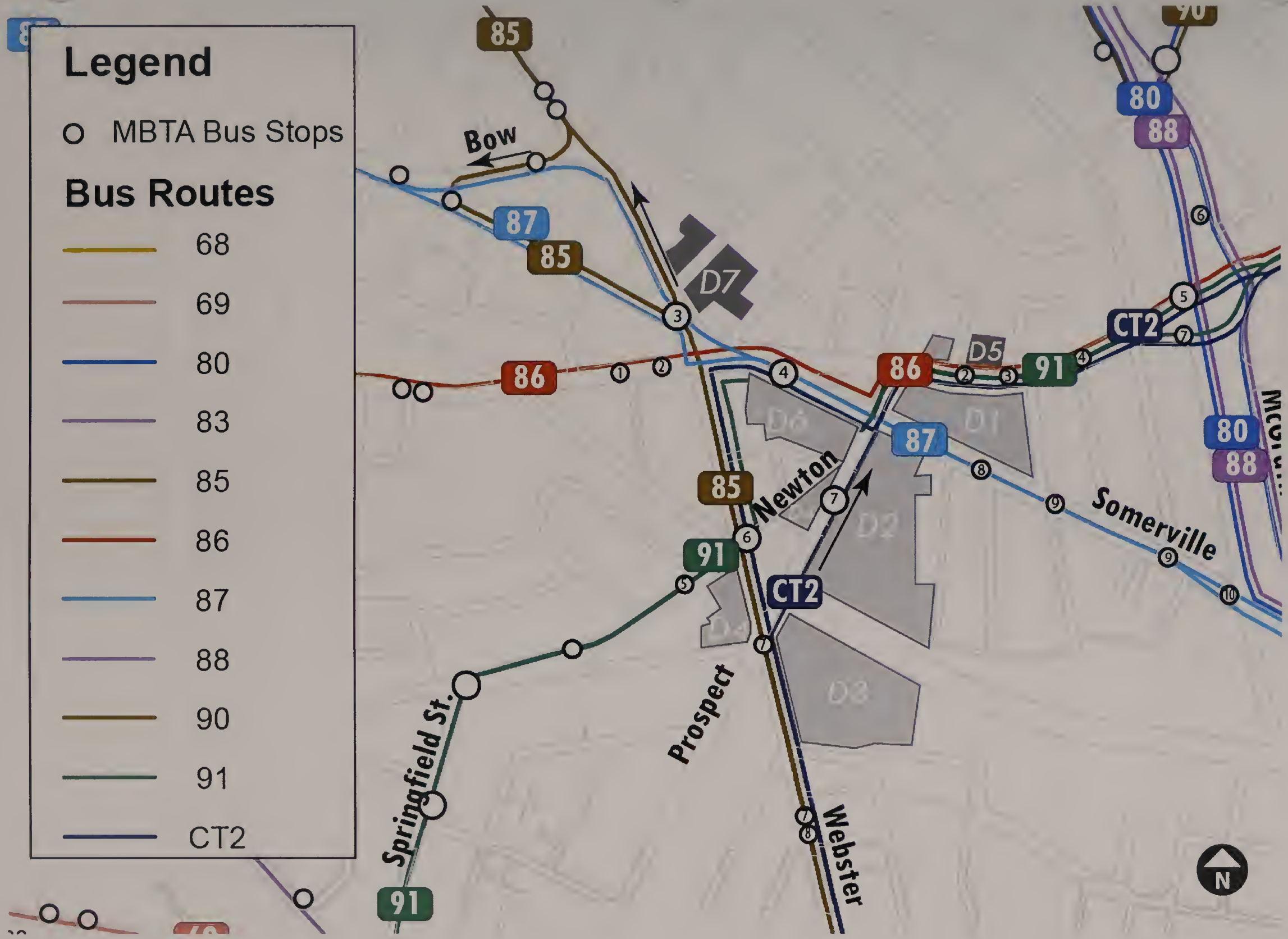
- Consideration of a dedicated bus lane (peak hour or all day) on Washington Street.

- Consideration of a dedicated bus lane (peak hour or all day) on Central Broadway.
- Consideration of queue jumps at intersections through strategic design.
- Ongoing traffic signal phasing and timing improvements which benefit all users.
- Moving towards adaptive traffic signal technology to improve overall operations.
- Ongoing consideration of bus stop moves to improve operations and align with area buildout.
- Changes to curbside use or roadway layouts to minimize friction and enhance safety and operations.
- Adding bump outs for bus stops, which would minimize bus dwell time and improve both speed and reliability – note that the City is in the process of designing these as part of its fully funded reconstruction of Somerville Avenue.

The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts and has participated in certain improvements. The City has both the ability and the willingness to attempt additional interventions to benefit transit. The City may use the overall transportation mitigation and funds provided per US2's development agreement to implement roadway changes. In addition, through the individual plans for each Lot, US2 will work with the City on potential transit improvements proximate to each Lot. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger transit operations within Union Square and will be used to help determine future improvements or the success of ones previously implemented. In addition, Sections 2.5.1 and 2.5.2 outline funding sources and the metrics that may be used as part of the annual monitoring program to determine future transportation improvements.

2.6 Bus Stops

Additional information was requested in the DEIR Certificate about coordination with the MBTA Service Planning Department regarding bus stop locations and improvements along Block frontages, particularly with respect to the stop in the vicinity of the future Union Square Station. As a condition of its master plan approval, US2 committed to improving the accessibility and comfort of existing bus stops that are located on Project Lot frontages (i.e., six existing bus stops located on Lots D1.2, D2.1, D3.1, D4.3, D6.2 and D7.2). Existing bus stops are shown on Figure 2-1.



Union Square Somerville, Massachusetts

Figure 2-1
Existing Bus Stops

As plans are submitted for each Lot, US2 will work with the City and the MBTA on the location, potential improvement and design of bus stops per the then current MBTA plans and City and MBTA design guidelines. The proposed improvements will be part of the Transportation Access Plan and Mobility Management Plan for each Lot. This process is underway for the bus stop on Prospect Street proximate to Lots D2.1, D2.2, and nearby the future Union Square Station.

2.7 Traffic Monitoring Plan

As requested in the DEIR Certificate, this section provides an expanded traffic monitoring plan.

As a component of the overall Mobility Management Plan, the DEIR, Section 4.5.8.1 pages 4-237 to 4-238, described the items to be included in the traffic monitoring and annual reporting including:

- Annual travel surveys;
- Biennial counts of car and bike occupancy and driveway in/outs; and
- Status updates provided annually to the City.

At the request of MassDOT, the following items have been added to the traffic monitoring and reporting plan:

- Updates on the TDM plan implementation;
- Periodic Weekday a.m. and p.m. turning movement counts and operations analysis at key intersections within the study area;
- Bicycle usage data;
- Periodic Multimodal traffic counts; and,
- Reporting on MBTA Comfort Metric for bus service in the Project area.

A detailed description of the traffic monitoring and reporting plan is provided below.

Annual Reporting will be conducted to track, assess, and report on the implementation of the Mobility Management Plan as required by the Somerville Zoning Ordinance and the Planning Board's Mobility Management Plan Submittal Standards. A goal of the Mobility Management Plan is to control the percentage of trips made by automobiles to 40 percent or less and implement additional mobility management programs and services if annual monitoring and reporting identifies a shortfall in meeting that goal.

The Project will work with the City, MBTA and MassDOT to coordinate its annual monitoring program with other ongoing data collection efforts to maximize the ability to determine the need and plan for modifications as appropriate. Responsibility for monitoring is formalized through the Mobility Management Plan agreements completed for each Lot with the City.

As the Project is implemented, it is anticipated that a high degree of coordination will continue among individual properties, even as the ownership and management structure of individual Lots evolves. Commercial parking will continue to be shared amongst uses, per all agreements, and many other operational, policy and TDM programs will be addressed in a coordinated fashion to maximize their effectiveness. As individual Lots receive their Certificates of Occupancy, joint Annual Reporting will be necessary to properly address all components of the monitoring program and to expedite the City's ability to complete review and utilize the information contained therein. Monitoring and reporting will be completed and presented by Lot (e.g., surveys) and for the Union Square area (e.g., multimodal counts) as appropriate and determined through ongoing City coordination. Annual reporting will be completed jointly by the Property Owner(s) with responsibilities distributed proportionally, and commensurate with the level of development realized at the agreed upon reporting time as defined by the then current list of Certificates of Occupancy by Lot.

The coordinated annual monitoring program may include the following as determined and required by the individual Mobility Management Plans.

Annual Travel Surveys

Travel surveys of employees are a key component of understanding the level of compliance with policy goals, the manner in which residents and employees are traveling, and whether they are aware of the travel options that are available to them. User questions will follow City requirements as available, and will cover topics such as:

- Mode choice for commute;
- Mode choice for other trips;
- Work hours;
- Travel distance;
- Reasons for most common mode choice; and
- Awareness of commute options.

It is likely that the survey will be digital, but if response rates are low, employers and/or property managers will be encouraged to supplement digital responses with intercept or paper surveys.

Annual Reporting of Parking Utilization and Operations for Any Commercial Parking Facility

As part of annual monitoring, all commercial parking facilities in the Project will provide reports of parking utilization and operations. These reports may include information such as entry/exit, rates, overall utilization by time period, breakdowns by parking type (handicap, carshare, electric vehicle) and other information as appropriate and determined.

Biennial Counts of Parking Occupancy and Site Driveway ins/outs

Management for the Project's parking will conduct car and bike parking occupancy counts. These counts will consist of simultaneous automatic traffic recorder counts at each site driveway for a continuous 24-hour period on a typical weekday. These driveway counts will be submitted biennially as part of a Mobility Status Update.

Multimodal Traffic Counts

US2 may conduct a variety of multimodal traffic counts and analysis at a proportional scale to the level of development realized in a given period per the conditions of its CDSP and other permitting agreements and conditions with the City. This data may help inform the City's on-going analysis of transportation conditions and decisions regarding the need for additional mitigation measures. Information collected may vary and be adapted to then current concerns, which may include the following considerations:

- Weekday a.m. and p.m. turning movement counts and operations analysis for pedestrians, bicycles, and vehicles at key locations within the study area.
- Consideration of HSIP locations may inform selected intersections.
- Transit (bus and train) ridership counts (as provided by the MBTA).

Reporting on MBTA Comfort Metric

For annual reporting, per the Mobility Management Plan, US2 will obtain from the MBTA the overall Route Comfort metric for each of the MBTA bus routes that serve the Project area. Reports will include a comparison of the most recent route performance with previous reports and the then current MBTA policy and overall system average. This information is obtainable from the MBTA and will not be independently calculated. Changes in route performance relative to the Route Comfort metric may be used to identify the potential for needed area infrastructure or service improvements.

Mobility Status Update

Based on the findings from the survey and the most recent set of biennial counts, building management will submit a Mobility Status update annually to the City. The update will follow any guidelines provided by the City and describe features such as:

- Travel Survey results;
- Site Driveway counts;
- Multimodal Traffic counts;
- Digital files as required; and,
- Comparison with and review of previous trends as data is available.

Greenhouse Gas Analysis

3.0 GREENHOUSE GAS ANALYSIS

3.1 Introduction

The Greenhouse Gas (GHG) emissions sources can be categorized into two groups: (1) stationary sources, or emissions related to structures and equipment that are stationary on the site; and (2) mobile sources, or emissions related to transportation. Stationary sources can be further broken down into direct sources and indirect sources; direct sources include GHG emissions from on-site fuel combustion, and indirect sources include GHG emissions associated with electricity and other forms of energy that are imported from off-site power plants via the regional electrical grid for use on-site.

An initial GHG analysis was presented in the DEIR. This analysis addressed the GHG emissions that would be generated by operation of the Project and associated traffic, and options that may reduce those emissions in accordance with the MEPA GHG Policy. The GHG analysis focused on emissions of carbon dioxide (CO_2). As noted in the GHG Policy, although there are other GHGs, CO_2 is the predominant contributor to global warming. Furthermore, CO_2 is by far the predominant GHG emitted from the types of sources related to this Project, and CO_2 emissions can be calculated for these source types with readily available data.

The GHG analysis presented in the DEIR detailed building energy modeling for the planned Project. The DEIR Certificate included a Scope of Work for further GHG analysis based primarily on comments from the Department of Energy Resources (DOER). US2 and the Project team met with the MEPA office and DOER on March 22, 2019 to review the comments and discuss the response approach. As the building designs have advanced since the filing of the DEIR, design decisions have been informed through careful modeling and cost analysis. In this continuation of the GHG analysis, Project details are updated, DOER comments are addressed and the scope within the DEIR Certificate is addressed. Responses to the specific items identified within the DEIR Certificate can be found as follows:

- Analyze the energy savings and reductions in GHG emissions that would be achieved by constructing buildings in accordance with Passive House design standards (see Section 3.4).
- Analyze the feasibility of constructing the buildings to a Passive House standard (see Section 3.4).
- Analyze an aggressive electrification approach to the Project, including the use of variable refrigerant flow (VRF) heat pumps (see Section 3.5).
- Address the Project's consistency with the City's goal of becoming carbon neutral by 2050 (see Section 3.6).

- Include evaluation of additional scenarios associated with an aggressive electrification approach (see Section 3.5).

- Include commitments to build one or more multi-family buildings to Passive House standards and/or incorporate electric heat and hot water into the Project design (see Sections 3.4 and 3.5).

3.2 MassSave Incentives Coordination

As requested in DOER's DEIR comment letter, US2 and the design team met with Eversource's MassSave representative Mr. Brendan Giza-Sisson on May 7, 2019 to review their incentive programs. Mr. Giza-Sisson discussed the "custom" and "prescriptive" incentive paths, highlighting opportunities to maximize incentives by getting Eversource involved early. The group reviewed the various levels of incentives depending on building performance. Additionally, Mr. Giza-Sisson confirmed the approach taken by the design team to estimate available MassSave incentives, which were included as part of the FEIR analysis.

Finally, Mr. Giza-Sisson reviewed plans for a Passive House incentive that is still in the planning stages. While the details of this program continue to be resolved, MassSave hopes to incentivize Passive House projects at a level that will cover the soft cost increases associated with designing to a Passive House standard. Mr. Giza-Sisson put the Project team in touch with the MassSave Passive House coordinator, suggesting that the timing of the Project might align with a MassSave Passive House pilot program. US2 and the Project team will continue to stay in close coordination with Eversource to ensure that the Project can take advantage of incentive programs that will improve the Project's sustainability. As a next step, the Project team intends to meet with Eversource to follow-up on the custom incentives program for the D2 Block. Meetings regarding the development of the Project's other Lots will take place when the design of those buildings commences.

3.3 Envelope Design Improvements

The DEIR detailed envelope characteristics for the proposed building designs. Only three of the proposed eight building model groups had an overall vertical envelope performance below prescriptive code levels: Model Group 4 (Small Office), Model Group 5 (mid-rise hotel) and Model Group 6 (D2.2-2.3). In order to design the most energy efficient building possible, the design team has improved the proposed designs for these buildings to improve their overall building enclosure performance. Consequently, the previous trade-off of heating, ventilation and air conditioning (HVAC) gains for reduced envelope performance has been eliminated for all model groups, consistent with DOER's recommendation. The updated table of Inputs has been included in Appendix E with changes highlighted.

Model Group 4 (Small Office)

Model Group 4 (small office) includes Buildings D4.1, D5.2 and D2.4. The prototype building for this model group is D4.1, a four story, approximately 30,000 sf building with a mix of commercial space. D4.1 had originally proposed a window-to-wall ratio (WWR) of 40 percent, with 50 percent framed insulated wall and 10 percent opaque portion of curtain wall. The envelope design has been improved to 34 percent glass, 56 percent framed insulated wall and 10 percent opaque portion of curtain wall. Additionally, the proposed glass for this building type has been improved to a U=0.388 window. These changes improve the building's overall building enclosure performance to better-than prescriptive code levels. All other modeling inputs remain unchanged from DEIR levels. Please refer to Table 3-1 for updated envelope performance details.

Table 3-1 Model Group 4 (Small Office) Envelope Design Changes

Measure	Baseline		FEIR Proposed	
	R equiv	U	R equiv	U
Roof	31	0.032	31	0.032
Framed & insulated wall	18.2	0.055	0.25	0.040
Percent wall		69%		56%
Spandrel		-	8.0	0.125
Percent spandrel		-		10%
Window	2.4	0.42	2.6	0.38
Percent Window		31%		34%
Aggregate vertical assembly	5.9	0.168	6.0	0.167

New modeling has been conducted to reflect the improved envelope performance. Improved energy and GHG reductions are summarized in Table 3-2. The revised model output has been included in Appendix E.

Table 3-2 Model Group 4 (Small Office) Envelope Performance Results

Measure		Baseline	FEIR Proposed	DEIR Proposed
EUI	kBtu/sf/yr	60.8	49.0	51.6
GHG Emissions	tons/yr	156	129	134
GHG Reduction		-	**-17.4%**	**-14.2%**

Model Group 5 (Mid-Rise Hotel)

Model Group 5 includes Building D1.1, a five story, approximately 104,000 sf building comprised of a hotel use above ground floor retail. In the DEIR, Model Group 5 had a proposed window U-value of 0.42. This value has been improved to U=0.388. This change improves the building's overall building enclosure performance to better-than prescriptive code levels, and eliminates

trade-offs as recommended. The DEIR WWR ratio of 40/60 remains unchanged. All other modeling inputs remain unchanged from DEIR levels. Please refer to Table 3-3 for updated envelope performance details.

Table 3-3 Model Group 5 (Mid-rise Hotel) Design Changes

Measure	Baseline		Proposed	
	R equiv	U	R equiv	U
Roof	31	0.032	31.3	0.032
Framed & insulated wall	18.0	0.056	25.0	0.040
percent wall		66%		60%
Spandrel		-		-
percent spandrel		-		-
Window	2.4	0.42	2.6	0.388
percent Window		34%		40%
Aggregate vertical assembly	5.6	0.179	5.6	0.179

New modeling has been conducted to reflect the improved envelope performance. Improved energy and GHG reductions are summarized in Table 3-4. The revised model output has been included in Appendix E.

Table 3-4 Model Group 5 (Mid-rise Hotel) Envelope Performance Results

Measure		Baseline	FEIR Proposed	DEIR Proposed
EUI	kBtu/sf/yr	140.6	111.3	111.0
GHG Emissions	tons/yr	1,112	943	940
GHG Reduction		-	**-15.2%**	**-15.5%**

Model Group 6 (D2.2-2.3)

Model Group 6 includes Building D2.2-D2.3, an approximately 429,000 sf residential building comprised of a five-story wood frame building (D2.2) and a 25-story tower (D2.3). Retail is included throughout the ground floor of each building.

In the DEIR, Model Group 6 had a proposed WWR of 45 percent. In advancing design and in the interest of eliminating envelope trade-offs and improving performance, D2.2-2.3 was modified to reduce its window openings to 40 percent of its wall. This change brings the building's overall enclosure performance to better-than prescriptive code levels. All other modeling inputs remain unchanged from DEIR levels. Please refer to Table 3-5 for corrected envelope performance details.

Table 3-5 Model Group 6 (D2.2-2.3) Design Changes

Measure	Baseline		Proposed	
	R equiv	U	R equiv	U
Roof	31	0.032	35	0.029
Framed & insulated wall	18.2	0.055	20.8	0.048
percent wall		60%		60%
Spandrel		-		-
percent spandrel		-		-
Window	2.4	0.42	2.4	0.420
percent Window		40%		40%
Aggregate vertical assembly	5.0	0.201	5.1	0.197

New modeling has been conducted to reflect the improved envelope performance. Improved energy and GHG reductions are summarized in Table 3-6. The revised model output has been included in Appendix E.

Table 3-6 Model Group 6 (D2.2-2.3) Envelope Performance Results

Measure		Baseline	FEIR Proposed	DEIR Proposed
EUI	kBtu/sf/yr	100.9	76.0	76.8
GHG Emissions	tons/yr	3,398	2,899	2,926
GHG Reduction		-	**-14.7%**	**-13.9%**

3.4 Passive House Analysis

3.4.1 Introduction

The City has adopted a goal of becoming carbon neutral by 2050, and US2 seeks to make a meaningful contribution towards that goal with the Project. A commitment to build one or more multifamily buildings to Passive House standards was one way suggested by the DEIR Certificate to contribute to that goal. To that end, as requested, a thorough Passive House analysis was performed by a certified Passive House Consultant to inform the decision-making process (see Appendix E). In advance of this report and at the suggestion of DOER, US2 undertook considerable due diligence to ensure any assumptions were consistent with those of experts in the field who were familiar with both the opportunities and obstacles associated with what was described by the co-Founder of Passive House Institute US, Katrin Klingenberg, as "an engineering feat."

US2 attended conferences (PHMass, NAIOP), and engaged owners (Affordable Housing Developers), engineers, and consultants (Building Evolution Corporation, BR+A) to understand the engineering and pre-design challenges associated with Passive House. Subsequently, US2 heard firsthand of the complexities of implementation and the importance of team experience from Commodore Builders, the general contractor of Boston's first certified multi-family project and a

residence hall at Wheaton College. Lastly, together with the Union Square Neighborhood Council, US2 also met with ICON Architecture, the architect and team member with Commodore Builders of the Distillery Project.

This due diligence with subject thought leaders was instrumental in understanding the technical nature of Passive House, its associated hurdles and constraints, in parallel with the opportunities for innovation and the benefits it could afford residents if executed correctly.

In concert with DOER comments, the scope of this Passive House Analysis focuses on the Phase 2 and 3 residential buildings. The Phase 1 residential building (D2.2-2.3) is very similar to the Phase 3 residential building (D3.2) which was considered for Passive House as part of the FEIR. Analyses and conclusions can be applied to both. Lab buildings are not well suited for Passive House, as the energy use intensity of labs are well above Passive House standards. US2 will continue to consider other building types for Passive House including future office buildings, however, the Phase 2 and 3 residential buildings most closely align with the Passive House prototype.

3.4.2 Energy Use Estimate

Passive House is a building standard for ultra-low energy buildings that focuses on air tightness and a super-insulated building enclosure. Buildings designed to meet the Passive House standard can achieve reductions in energy use of 65-80 percent below standard construction based on IECC 2009. Typical enclosure values for a multi-family Passive House building in climate zone 5A include R-40 (U-0.025) walls and an R-60 (0.017) roof with triple glazed windows (U-0.15). Air infiltration of the enclosure must not exceed 0.6 air changes per hour (ACH) at 50 Pascals of pressure (equivalent: 0.08 cfm/sf @ 75 pa).

The potential energy and emissions savings of constructing the residential buildings to meet the Passive House standard were evaluated assuming that a performance Energy Use Intensity (EUI) of 20 kBtu/sf-yr would be achieved.

3.4.3 Passive House Feasibility

In order to determine the feasibility of Passive House for the balance of the Project's residential buildings, the team prepared an economic analysis for each building that considered first cost, ownership cost, and operational costs (and savings) of a Passive House approach to each building. Available incentives were also identified and included to offset first costs. The analysis assumes that the energy savings outlined above could be achieved and that the residential building energy systems would be all electric. Please refer to the Passive House Study in Appendix E for details of the analysis.

Table 3-7 Passive House Feasibility Analysis Summary (estimated)

Building	Units	Cost Premium ($)	Incentives ($)	Net Premium ($)	Operational Savings ($/year)	Payback Period (years)	GHG Emission Reduction (%)
D3.2	376	$2.9 M	$1.1 M	$1.8 M	$232,000	8.0	52.8
D4.3	48	$480,000	$204,000	$276,000	$38,000	7.3	52.8
D5.3	25	$266,000	$110,000	$156,000	$21,000	7.5	52.9
D7.1	34	$355,000	$148,000	$207,000	$28,000	7.5	52.8
D7.2	65	$684,000	$283,000	$401,000	$54,000	7.5	52.7

As indicated above, after considering currently available incentives, payback periods for Project Passive House residential buildings are projected between 7.3 to 8 years. These extended payback periods are the most likely explanation for the slower adoption for market-driven Passive House projects that do not have institutional investment horizons or that are not supported by significant financial incentives, zoning bonuses or subsidies. This is consistent with market observations as the few local-market Passive House precedents are mid-rise in scale and institutional or affordable housing projects.

The DEIR Certificate asked that the Passive House cost evaluation reflect the economies of scale that can be achieved by the Project. Since the Project will be largely financed Lot by Lot over a period of time like many other large-scale Projects, each individual Lot must be financially feasible on its own. Construction for each Lot will also be procured individually and from contractors best suited for that particular product type (i.e., mid-rise residential, lab/office, office, hotel, high-rise residential). Consequently, it is difficult for the Project to take advantage of economies of scale with respect to Passive House. However, as described in Section 3.7, the Project does hope to take advantage of its scale for PV implementation on the rooftops.

The Passive House Study and US2's Passive House due diligence revealed the following considerations relative to broad implementation of Passive House on the residential portion of the Project:

- Passive House can achieve meaningful energy use and GHG reductions.
- Passive House can provide attractive benefits to occupants including: noise reduction, indoor air quality improvements, comfort improvements and higher quality doors and windows.
- There are currently available incentives that can reduce the payback periods associated with Passive House.
- Passive House comes at a cost premium and payback periods are significant.

- The local construction market, building trades, designers and lenders have limited familiarity or experience with projects seeking Passive House certification at any scale and the attendant benefits, costs and risks. Thus, the pool of qualified professionals who can deliver a building to market is limited. This increases the cost of Passive House projects and potentially acts as a barrier to broader market adoption. For example, US2 spoke with a local affordable housing developer that recently estimated the cost of a mid-rise Passive House project and identified an 8% cost premium when compared to the non-Passive House alternative.

- Demonstration Passive House projects and Passive House incentive programs will be critical to creating market acceptance and lowering costs for Passive House projects. Based on US2's interaction with market participants, there appears to be local focus in these areas which is very positive.

- Market demand is not yet driving Passive House; thus, the Project may be perceived as financially risky, and given current housing costs in Massachusetts, renters are not looking to pay a premium for this, despite the many benefits – particularly if costs for high-performance are being passed onto them.

- Passive House is not well suited to high-rise construction in Union Square. Electric systems including VRF technology are limited in their vertical reach and are not recommended for buildings greater than 12 to 14 stories. Additionally, the compact floorplan of the residential tower as required by zoning does not allow for mechanical rooms on the exterior portions of the floor plate.

- The exclusion of the retail and parking portions of the buildings will create technical and cost challenges. To maintain R-65 continuous insulation, the second story ceiling will need to accommodate the added thickness, increasing both the structural loading of the building (not yet accommodated for) and the floor-to-ceiling height to maintain required vehicle clearances.

3.4.4 Passive House Commitment

US2 is committed to advancing the goal of the state, the City, and the Union Square neighborhood to see Passive House in Union Square and to help establish a local market for Passive House. US2 will commit to delivering the multi-family project on D4.3 as a Passive House project despite the significant payback periods and the nascent local market. The D4.3 project is a prime candidate since it is envisioned as the next residential project to be developed, its unique project characteristics suits Passive House (see below) and it's located near Union Square Station. This commitment will result in GHG reductions of 52.8 percent for this building and contribute to Project-wide GHG reductions. As described in Section 3.7 below, US2 is also committed to a rooftop PV set-aside on D4.3. If PV could also be added to D4.3, it will move that much closer to being carbon neutral.

Of the analyzed buildings within the Passive House Study, Building D4.3 was found to provide the best reference point to assess feasibility of implementation. D4.3 is an approximately 48-unit, four story multifamily residential building (residential portion is approximately 54,000 gsf) with ground floor retail (approximately 7,000 gsf – excluded for the purposes of the study) located at the confluence of Webster Avenue and Prospect Street, directly adjacent to Union Square Station. This building is particularly suited for Passive House for the following reasons:

- It has a regular, rectangular shape, which makes Passive House detailing more achievable.
- It will benefit most from the noise reduction benefit of Passive House super-insulation.
- It has a predominantly east/west configuration, an orientation downside which Passive House will help to mitigate the impacts of.
- The east/west orientation will support an efficient rooftop solar PV layout (facing due south).
- Passive House was written for residential buildings, and there is limited retail program to exclude within D4.3's program.
- It is within scale of other developer-driven, regionally-built Passive House examples and would benefit from precedent.
- The long/narrow form allows for passive ventilation/solar heating, demonstrative of Passive House potential.
- The architectural expression of a building of this scale aligns with the punched-openings/lower window-to-wall ratios needed for performance, a hallmark of Passive House design.

US2 is excited about developing D4.3 as Passive House. Direct Passive House knowledge and experience will allow US2 to continue to test Passive House feasibility on the balance of the residential portions of the Project as they are designed and developed. It is the Project team's hope that D4.3 will pave the way for more Passive House in Union Square and Greater Boston.

3.5 Aggressive Electrification Approach

3.5.1 Electric Mechanical Systems Analysis

DOER's comment letter recommended that the Project consider an aggressive electrification approach of Project systems in order to reduce GHG emissions. As the electric grid is projected to continue its downward GHG emissions trend due to a greater reliance on renewable sources as time goes on, electrification of HVAC systems would ensure Project GHG emissions mirror that downward trend.

In order to understand the feasibility of the aggressive electrification approach, each of the Project Model Groups has been considered for electrification and analyzed as appropriate herein. In addition, as requested by the DEIR Certificate, two electrification scenarios have been analyzed for the relevant Model Groups: (1) VRF HVAC systems with gas domestic hot water; and (2) VRF HVAC systems with heat pump domestic hot water. The analysis includes projected energy use and GHG emissions for each scenario as well as a comparison against the baseline and proposed cases. In order to understand the potential financial feasibility of electric HVAC systems, a preliminary economic evaluation has also been conducted. This study applies currently available incentives and annual operational savings against increased first costs. The electrification study with full results can be found in Appendix E.

A summary of the results of the analysis is provided in Table 3-8 for Model Groups 3 through 8. As described in more detail herein, Model Groups 1 & 2 were not analyzed for electrification due to the incompatibility with likely lab uses in these buildings.

Table 3-8 Electrification Summary

	GHG Reduction	Payback (years) (compared to Proposed)
Model Group 3 (Medium Office/Retail)		
Proposed	-14.4%	
Alternative 3 VRF w/DOAS Gas DHW	-36.5%	9.6
Alternative 4 VRF w/DOAS HP DHW	-35.7%	10.3
Model Group 4 (Small Office/Retail)		
FEIR Proposed	-17.4%	
Alternative 3 VRF w/DOAS HP DHW	-34.0%	9.6
Model Group 5 (Hotel)		
FEIR Proposed	-15.2%	
Alternative 3 VRF w/DOAS Gas DHW	-24.7%	12.9
Alternative 4 VRF w/DOAS HP DHW	-11.7%	Does not pay back
Model Group 6 (Large Residential D2.2-2.3)		
FEIR Proposed	-14.7%	
Alternative 3 VRF w/DOAS[1] HP DHW	-15.6%	289.6
Model Group 7 (Large Residential D3.2)		
Proposed	-14.7%	
Alternative 3 VRF w/DOAS[1] HP DHW	-12.3%	Does not pay back
Model Group 8 (Mid-Rise Residential D4.3)		
Proposed	-12.7%	
Proposed Env. VRF w/DOAS HP DHW	-20.0%	16.3

[1] VRF, heat pump water heater alternative in mid-rise residential portion only.

3.5.2 *Overview of Model Group Analysis Assumptions*

Model Group 1 (Large Lab/Office/Retail) includes D2.1, a lab/office building in Phase 1. After investigation by the Project team, it was determined that electric HVAC systems are not an appropriate system for the anticipated lab uses in this building. VRF technology is not able to supply the air changes necessary to support a lab space. Therefore, it was not modeled for electrification. This building was, however, modeled with a chilled beam alternative in the DEIR. The GHG reduction associated with this chilled beam alternative was minimal and it was eliminated from further consideration due to the costs associated with chilled beam systems.

Model Group 2 (Large Office/Retail) includes Buildings D1.2, D3.1 and D3.3. The prototype building for this model group is D1.2, a 10 story, approximately 248,000 sf building with a mix of commercial space. Given the demand for life sciences space in the Greater Boston/Cambridge/Somerville region, it is likely that these buildings will ultimately contain lab uses. These larger commercial buildings maintain an appropriate building footprint to accommodate the lab space proportions desired in this market. In response to DOER comments, Building D1.2 has been modeled as an office building, as to not take credit for lab ventilation energy loads when evaluating envelope alternatives. However, given the intended lab uses of these buildings, electric HVAC systems are not appropriate, as VRF technology cannot supply the air changes necessary to support a lab space. Therefore, it was not modeled for electrification.

In the DEIR, D1.2 was modeled with a chilled beam alternative. The GHG emissions associated with this alternative increased in this case. For this reason, chilled beams were eliminated from further consideration.

Model Group 3 (Medium Office/Retail) includes Buildings D6.1 and D6.2. The prototype building for this model group is D6.1, a five story, approximately 112,000 sf building with a mix of commercial spaces. Given the more restrictive height limits on the D6 Lots, while possible, it is unlikely that these buildings will be developed for lab uses. These buildings have been modeled as typical office buildings. D6.1 was evaluated for electric systems.

Model Group 4 (Small Office) includes Buildings D4.1, D5.2 and D2.4. The prototype building for this model group is D4.1, a four story, approximately 30,000 sf building with a mix of commercial space. The small typical floor plate of the Model Group 4 buildings makes it unlikely that these buildings will meet the needs of a lab user. The smaller scale of these buildings was an intentional result of the master plan visioning process, in which the importance of cost-effective spaces for smaller, early stage companies was highlighted. These buildings have been modeled as typical office buildings. D6.1 was evaluated for electric systems.

Model Group 5 (Midrise Hotel/Retail) includes Building D1.1, a five story, approximately 104,000 sf building with a mix of hotel and retail space. Although the hotel may employ VRF technology, the HVAC system selection is likely to be brand dependent. Restricting flexibility of the

partnership to participate in system selection runs counter to the goal of attracting commercial users to revitalize Union Square. In any case, D1.1 was modeled with VRF so as to inform future decision-making for this portion of the Project.

Model Group 6 (Large Residential/Retail) includes Building D2.2-D2.3, an approximately 429,000 sf residential building comprised of a five-story wood frame building (D2.2) and a 25-story tower (D2.3) anticipated to be constructed as the first phase of the Project. Retail is included throughout the ground floor of each building.

The 25-story residential tower (D2.3) is not suited to employ VRF technology as it encounters limits of vertical reach relative to piping length, vertical height, and refrigerant charge limits to meet safety code. An approach to overcoming these constraints, by introducing louvered mechanical rooms on each floor at the exterior of the tower to limit piping runs, was found to also be untenable per the zoning that governs the tower. Moreover, displacing windows and views afforded by the tower's height with mechanical rooms presents challenges to the Project's marketability.

The proposed mechanical system for the D2.2 wood-framed building is a hot water/direct expansion (DX) split system utilizing "Aquatherm" air handler units (AHUs) in each apartment. The AHUs are supplied heating and cooling via each apartment's tankless condensing hot water heater and high efficiency air cooled condensing unit, respectively. A dedicated outside air system with energy recovery will provide fresh air ventilation and a means for central exhaust. Building D2.2 (mid-rise portion only) was evaluated for electric systems.

Model Group 7 (Large Residential/Retail) includes Building D3.2, an approximately 351,000 sf residential building comprised of a 24-story tower and lower height wood framed portion. Retail is included throughout the ground floor of the building. While similar to Model Group 6, Building D3.2 was modeled separately to capture massing and orientation variations.

D3.2 was modeled with a VRF system and heat pump DHW in the lower-height wood-framed portion of the building. Like Model Group 6, the tower component of D3.2 is not suited to employ VRF technology, per the previously described technical, zoning, and marketing limitations.

Model Group 8 (Mid-Rise Residential/Retail) includes Buildings D4.3, D5.3, D7.1 and D7.2. The prototype building for this model group is D4.3, a four story, approximately 61,000 sf building with a mix of residential and retail spaces. D4.3 was evaluated for electric systems.

D4.3 was modeled with a VRF system and heat pump DHW. The GHG reductions associated with these technologies is significant, as evidenced by Table 3-12 which depicts energy use and GHG reduction estimates associated with these alternatives.

3.5.3 *Electrification Summary*

As outlined above, an electrification approach to Project buildings would yield significant GHG reductions for the Project and US2 recognizes the importance of reducing the carbon dependency of the Project. This electrification analysis and our conversations with subject matter experts highlighted several considerations that must be weighed as building electrification is evaluated for the Project:

- Electrification can yield significant GHG reductions provided the electric grid continues it downward GHG trend due to greater reliance on renewables.
- Incentives currently exist that help reduce the payback periods for electrification alternatives.
- There is a cost premium associated with VRF, and payback periods are significant.
- VRF technology has limits to its applications. It is not suited to laboratory spaces, as it cannot handle the frequent 100% outside air changes required by this use. Local climate factors further challenge implementation and/or drive system redundancy. There is also limited precedent for large-scale VRF installations in the Boston market.
- VRF's maximum vertical reach is typically limited to 12 to 15 floors. An alternative approach would involve locating louvered mechanical rooms on each floor at the exterior of the tower. However, dedicating the necessary exterior rentable space to a mechanical room would challenge the financial viability and marketability of the building. Further, the Union Square Zoning precludes mechanical equipment from being located on any building façade.
- VRF systems have a typical life expectancy of 10 to 15 years. They require frequent replacement.
- In some instances, like the hotel and commercial buildings, tenants or users may drive the decisions around mechanical equipment selection due to their specific user needs.
- Variability of future building technology and economics make it difficult to commit to a particular HVAC system so far in advance of more detailed design.
- The future availability of incentives cannot be guaranteed. There has been recent evidence of state incentives being offered for various building technologies, including air-source heat pumps and VRF systems, only to see these incentives phased-out after a period of time. While currently available incentives are included in the preliminary economic evaluation, there is no assurance that these incentives will be available in the future.
- Future utility costs are unknown.

- While operational savings are factored into the simple payback calculation for these systems, in actuality, operational savings will not typically be realized by the owner, but by the tenant paying the utility bills.

Through this MEPA process, an aggressive approach to electrification has been thoroughly evaluated and cost analyzed, providing data that support decision making at the time of an individual building's realization. Although there are GHG benefits, the associated payback periods are significant, from 9.6 years for the small and medium office model groups, to never paying back for the hotel and large residential building.

US2 recognizes the importance of reducing the carbon dependency of the Project. Electric HVAC systems will continue to be evaluated as the buildings move from master plan level to individual building design. The future evaluation of electric systems will consider then-current first costs, available incentives, and operational savings, understanding that both incentives and technologies will advance and evolve over time. Electric HVAC systems continue to advance their capabilities and market acceptance, and it is likely that partial or full electrification of these systems will be employed at various Project buildings. Additionally, in an effort to further demonstrate its commitment to GHG reductions on the Project, US2 has added a commitment to provide 100% of Phase 1 building energy needs will be procured from a qualified resource for green power, carbon offsets or renewable energy certificates for a period of 10 years.

3.6 Pathway to Carbon Neutrality

The City has been engaged in a multi-year planning process to achieve carbon neutrality by 2050. Steps taken to date include the development of the City's first Greenhouse Gas Inventory (2016), the Carbon Neutral Pathways Assessment (2017), and the Somerville Climate Change Vulnerability Assessment (2017) described in detail in the DEIR. The planning steps most recently culminated in Somerville Climate Forward (SCF - 2018), Somerville's first comprehensive climate change plan. The plan represents a set of implementable actions that will reduce Somerville's contribution to GHG emissions while increasing city resiliency to unavoidable impacts of climate change. Somerville's buildings, mobility, environment, community, and leadership are identified as distinct categories that will drive 13 identified action areas, all of which maintain relationships to the Project.

Buildings, both new and existing will play a significant role in achieving the City's carbon neutrality goal, and the Project will be consistent with this goal. Consensus around compliance objectives for SCF are still being explored, but are described as potentially including:

- High energy efficiency design, such as achieving Passive House or other recognized building certification programs;
- Electrification of building systems, including heating, hot water and cooking;
- On site and/or off-site renewable energy development; and

- Purchase of verifiable carbon offsets.

As described elsewhere in this chapter, building use-type, location and timing will drive achievement and inform the most appropriate pathway to carbon neutrality over the long term. Intensive lab uses, for example, and their necessary air exchanges complicate the potential of electrification through current VRF technology; though with time, this may change. Similarly, viability for onsite renewable alternatives will vary on a site by site basis, considering variations in subsurface conditions for potential geothermal solutions or productive roof area for photovoltaics.

In order to account for evolving technology, incentives, site opportunities and building programming over time, individual building projects will deliver a Sustainable and Resilient Buildings Questionnaire as part of the Design and Site Plan review process. This questionnaire ensures that the impacts of future climate conditions are carefully evaluated at the time of project pursuit, that efforts are made to reduce or eliminate GHG emissions and impacts related to climate change are mitigated in design, construction, and occupancy of buildings. Questionnaire subject areas include:

- Building Energy Use and Continuity;
- Climate Change Risk and Vulnerability;
- Managing Heat Risks; and
- Managing Flood Risk.

As it relates to the carbon neutrality goal specifically, projects that are not planned to achieve net zero energy upon delivery will describe a pathway of system adaptation over time and/or renewable energy production to achieve the 2050 goal. Delivered in parallel with individual building applications, this approach will ensure that the Project will remain current within the changing context of incentives, system technology and material science that will inform new paths to resilience and carbon neutrality over the long term.

Further, SCF - 2018 also identifies the role of the City to incentivize and facilitate Net-Zero buildings. While not yet enacted, identified development incentives of relaxed building height, increased density, reduced off-street parking requirements, reduced fees and expedited permitting may be considered to further guide and incentivize future development projects.

Absent certainty around these potential future incentives, and yet more than 30 years away, the Project's commitments to Passive House achievement on D4.3, solar ready roofs, PV set-aside area and green power purchasing on the first building projects, are demonstrative of the Project's consistency with the City's goal for carbon neutrality. These achievements through buildings are further supported by the mobility actions (*that reduce vehicle trips, incentivize green and electric vehicles, encourage bicycle use, and increase MBTA ridership*), and public realm enhancements (*walkability, tree canopy, green infrastructure, permeability, stormwater management*) that position the Project as a resilient model to follow.

3.7 Renewable Energy - Rooftop Solar

Another means for reducing overall GHG emissions from the Project is through the installation of solar photovoltaic (PV) systems on the rooftops of the individual buildings. In response to DOER's request to set-aside Project roof area for solar PV systems, US2 partnered with Solect Energy to further study the solar potential of the Project's rooftops and to help evaluate solar opportunities and considerations early in the planning process. Solect Energy is a top 10 solar provider in the United States and has installed over 90 megawatts of PV systems in 400 projects throughout the New England market. Based on this analysis, US2 will commit to set aside a minimum of 40,000 sf of Project roof area for solar PV systems. Some individual roofs may not be large enough or have a quick enough payback to attract third-party PV providers. US2 will aggregate rooftops locations to take advantage of scale and improve the PV opportunity. US2 intends to work with third-party solar providers to convert as much of the set aside area as possible to functional solar fields over the course of Project implementation. This effort will further reduce the GHG impact of the Project.

Analysis Approach

The Project team started by determining the total available roof area across the Project that might be set-aside for solar PV installations. To arrive at this number, an estimated portion of each roof necessary to host mechanical and elevator overrun equipment was subtracted from the total. Further, building specific zoning constraints were also factored. With these adjustments made, a resulting potential roof area of 124,000 SF was available for solar PV evaluation.

Solect Energy then reviewed each of these roof areas for solar productivity. Roof areas that were too small or that had limited solar productivity due to their location and shade impacts were observed to be impractical and excluded from further analysis. With inefficient areas excluded, the studied PV roof area results approximately 92,000 sf. This cumulative area across ten roof tops forms the basis of Solect Energy's financial and productivity analysis. As an early conceptual estimate, the area did not make accommodations for necessary conduits and the PV row spacing that would provide servicing access. As such, this study area represents a best-case scenario and assumes 100% efficiency in the future layout of the array.

For each of these roof areas, a separate estimate of solar productivity and a financial analysis was prepared by Solect Energy to determine economic feasibility based on today's solar market. The financial feasibility considered tax credits as well as state incentives to help offset initial capital costs and included a 20-year cash flow projection. The overall energy production of all of the roofs was estimated at 1,206,101 kWh of renewable energy and the break-even period for individual installations ranged from 6 years to 11 years with an average of 8 years. Table 3-9 provides additional details of this analysis on a Lot by Lot basis. Solect Energy's more detailed financial analyses for each roof area are included in Appendix E.

	PV PRODUCTIVITY ANALYSIS[1]							FEIR COMMITMENT		
Lot	Potential Roof Area (SF)	Studied Roof Area (SF)	Potential kW DC	Potential kWh	Cost per Watt ($)	Project Cost ($)	Simple Payback	PV Set Aside (SF)	Potential Additional Set-Aside (SF)[2]	Note
1.1	6,849	6,849	79.2	89,296	2.68	212,000	8 yrs	6,700		*shading from 1.2 am and pm, from 2.1 in winter*
1.2	17,237	17,237	185.6	198,134	2.25	418,000	7 yrs		16,600	*good exposure*
2.1	-		-		-	-				*planned as lab, no ovoiloble roof area*
2.2	14,066	10,626	115.4	119,203	2.41	278,000	8 yrs	10,200		*shading from 2.3, mid om to mid pm*
2.3	-		-		-	-				*mechanicals at tower roof, no availoble roof area*
3.1	15,352	15,352	185.6	198,134	2.25	418,000	7 yrs		14,800	*solor on south east and west, shoding from 3.2*
3.2	7,946		-	-	-	-				*too much shading with limited orroy areas*
3.3	18,332	18,332	214.1	237,191	2.25	482,000	6 yrs		17,700	*shading from 3.2 in PM*
4.1	2,962	2,962	33.9	38,684	3.49	118,000	11 yrs	2,800		*shaded by 2.3, small orea with extensive poyback*
4.2	-	-	-	-	-	-				*no solor, tao smoll*
4.3	9,897	7,112	93.6	113,537	2.61	244,000	7 yrs	6,800		*good exposure and praductivity*
5.2	2,862	2,084	26.5	29,302	3.76	100,000	9 yrs	2,000		*smoll with shading from 1.1 and 1.2, highest cost/wott*
5.3	3,986		-		-	-				*unpraductive, significant shading from 1.1 ond 1.2*
6.1	4,487		-		-	-				*limited avoilable area per zoning heigh sensitivities*
6.2	4,393		-		-	-				*limited availoble area per zoning heigh sensitivities*
7.1	6,680	4,317	60.8	68,123	2.86	174,000	8 yrs	4,100		*shoding from 7.2 in am*
7.2	9,237	7,738	95.2	114,497	2.60	248,000	7 yrs	7,400		*good exposure ond productivity*
Total	**124,286**	**92,609**	**1,090**	**1,206,101**		**2,692,000**		**40,000**	**49,100**	
kWh/SF				*13.02*						
						Avg. Payba	8 yrs			
						Maximum Potential Set Aside (SF)			89,**100**	*sum of PV Set-aside and Patentiol Additional Set-Aside*
						Imputed Productivity (kWh)			1,160,401	*Moximum Potentiol Set Aside * 13.02kWh*
						Imputed Cost			2,589,999	

[1] Analysis by solect energy provided on following pages

[2] Additional PV set-aside available in event buildings are delivered as office buildings. If lab, limited productive roof area would remain available.

In order to determine the roof area that could be committed to solar PV set-aside at this time, the commercial buildings that could be lab/office need to be identified and excluded from the set-aside area. Lab/office buildings have significant rooftop HVAC requirements that take up a majority of the available rooftop area and leave little area for a solar PV installation. Lots D1.2, D3.1 and D3.3 are all identified as potential lab/office buildings and as such, a commitment to a PV solar set-aside on these rooftops cannot be made until the final use is determined. The resultant solar PV set-aside area after excluding Lots D1.2, D3.1 and D3.3 is approximately 40,000 sf. Applying Solect Energy's resulting productivity per sf to this set-aside total results in an estimated yield of 520,943 kWh of renewable energy.

Based on this process, US2 has committed to reserve at least 40,000 sf of rooftop area for future photovoltaics. In addition, if one or more of Lots D1.2, D3.1 and D3.3 are ultimately planned as office rather than lab/office, additional rooftop set-aside areas will be added to the Project. If these buildings are constructed as more conventional office buildings, the rooftop area for future photovoltaics could grow to a maximum of approximately 89,000 sf.In this instance, estimated productivity would reach approximately 1,160,401 kWh. Each of these areas, for set-aside potential additional set aside, have been identified in Figure 3-1. The final roof areas, configurations and location of the solar PV set-aside are subject to revision and refinement as individual buildings are designed.

As US2 implements the Project, it will continue to work with Solect Energy and/or other solar providers to evaluate the feasibility of installing PV on the roof areas that are set-aside on the Project. It is expected that as the solar industry continues to mature, costs are reduced and economies of scale can be achieved across multiple Project rooftops, rooftop solar will be added to the Project to further reduce the GHG impacts of the Project.

3.8 Green Vehicle Infrastructure

Recent European Climate Foundation-commissioned studies indicate that replacing a fossil fuel-powered vehicle with an electric vehicle can cut that vehicle's lifetime GHG emissions by half. Given that the Project's mobile source emissions account for more than double the emissions of stationary sources, US2 recognizes the opportunity to make a significant impact to project-wide GHG reductions by encouraging the use of Green Vehicles. In total, 191 of these spaces will be provided and promote car sharing and green vehicle use across each commercial parking facility. Provided behavior around personal vehicles is expected to change through technological advancements, the US2 team initiated preliminary conversations with Energy Efficiency Consultant, Steve Conte of Eversource to understand available programs and resources to inform the distribution of these Green Vehicle Spaces. Together, allocations to carpool and carshare spaces, preferences for fuel efficient vehicles, EV Charging and EV Ready spaces incent the use of sustainable modes, with the latter two providing the adaptive capacity that positions the project to support the Commonwealth's goals articulated in the 'Multi-State ZEV Action' plan for zero emission vehicles. In summary:

Union Square Somerville, Massachusetts

Figure 3-1

PV Set-aside Area

- 72 spaces will be preferred parking spaces for low emitting/fuel efficient vehicles;
- 29 spaces will be provided as carpool parking spaces before 9:00 a.m. on weekdays;
- 38 electric vehicle charging parking spaces will be provided;
- 38 electric vehicle ready parking spaces will be planned; and

14 spaces will be provided for car sharing services.

Please refer to Appendix B for the proposed distribution of these spaces across the commercial garages within the Project.

3.9 Summary and Mitigation Commitments

3.9.1 Project GHG Summary

Table 3-10 presents an updated composite of the building GHG emissions profiles of the Baseline and Proposed cases. These improved emissions estimates reflect the changes made to the proposed building envelopes. There are no changes to the DEIR Mobile Source calculations.

Table 3-10 Project GHG Emissions Summary

	Baseline	Proposed	Difference	
	tons/yr			percent
Stationary Sources	18,202	15,651	-2,551	-14.0%
Mobile Sources	2770.2	2770.2	0	0%

3.9.2 Proponent Influence on Tenant

As required by the Building Code, any systems or building parameters that improve upon Building Code elements will be fully designed and included in plans submitted for building permits. Any further tenant build-out of commercial spaces will be mandated to be equal to or better than specified elements in terms of energy performance. This requirement will be detailed in lease language, to be developed. Tenant spaces may be individually metered for both electricity and water to encourage tenants to employ conservation techniques.

US2 intends to design and construct the Project and will require tenant build-out to be consistent with commitments made in this FEIR. US2, or a future developer or owner in the event the development rights or ownership is transferred, will be responsible for submitting the post-construction self-certifications demonstrating compliance with the commitments made during the MEPA process.

3.9.3 Proponent's Commitments to GHG Reduction

US2 is committed to environmental stewardship, and as the design of each building develops further, US2 expects that additional technologies described previously, or possibly new technologies developed in the interim period, may be adopted that will further decrease GHG emissions; however, these technologies are not yet ripe for selection. US2 will encourage the continued evaluation of energy efficiency and renewable energy measures throughout the life of the Project.

US2 has detailed its commitments to mitigate Project GHG emissions. US2 is committed to the following mitigation elements for the Project:

- A multi-family Passive House building on D4.3;
- Addition of Green Vehicle Infrastructure within Commercial Garages;
- Project commitment to reserve at least 40,000 sf of rooftop area for future photovoltaics;
- 100% of Phase 1 building energy needs will be procured from a qualified resource for green power, carbon offsets or renewable energy certificates for a period of 10 years.
- Light or reflective roofs;
- Energy Recovery;
- Daylighting controls in the office areas;
- Reduced lighting power densities;
- High performance exterior lighting;
- Energy Star appliances;
- Advanced elevators;
- High-efficiency HVAC equipment;
- Low-flow plumbing fixtures;
- Recycling collection areas;
- Energy Management System;
- Enhanced Building Commissioning; and
- Construction waste recycling.

US2 has evaluated in the design of the buildings all feasible GHG emissions mitigation in order to avoid, reduce, minimize or mitigate damage to the environment.

US2 is committed to implementing the energy efficiency and GHG emission reduction measures presented in this analysis, but must retain an amount of design flexibility to allow for changes that will inevitably occur as designs progress. If, during the course of design for a building, a specific combination of design strategies proves more advantageous from an engineering, economic or space utilization perspective, the design of the building may vary from what has been described herein. Energy performance minima and associated GHG emission reductions will be adhered to.

At the completion of each Phase, US2 will submit a self-certification to the MEPA Office, prepared in accordance with the GHG Policy. This certification will identify the GHG mitigation measures incorporated into a building and will illustrate the degree of GHG reductions from a Baseline case, as Baseline is defined in the DEIR, and how such reductions are achieved. Details of US2's implementation of operational measures will also be included.

Stormwater

4.0 STORMWATER

4.1 Introduction

As requested in the DEIR Certificate, additional information follows to describe how Project-related stormwater will be managed when flows cannot be directed into the MBTA's system, and how the site would be affected under such circumstances. Additional details regarding on-site resiliency or stormwater management measures that mitigate stormwater impacts are also described. For additional information regarding stormwater management and resiliency, please refer to Chapter 6 (Climate Change Resilience and Adaptation) and Chapter 9 (Stormwater) of the DEIR.

4.2 Stormwater Management Approach Overview

Stormwater management facilities constructed as part of the Project, together with the new 14-foot by 6-foot box culvert installed as part of the City's Utility and Streetscape Improvements project, will significantly improve the ability of the City's infrastructure to store stormwater and reduce the magnitude and extent of surcharging events in the Union Square area. The design of specific stormwater management facilities that will be constructed by US2 on each Lot will be selected depending on the site characteristics, constraints and opportunities associated with each Lot. Solutions may include green or blue roofs, bioretention basins, landscape areas, permeable pavements, or subsurface detention and/or infiltration structures. For all Lots, the rate of stormwater flow will be reduced from the existing condition for all storm events up to and including the 100-year storm event as determined in coordination with the City's Engineering Department as each Lot is permitted. Additionally, over the course of the Project, US2 has committed an estimated $4.6 million for offsite infrastructure improvements and will contribute approximately $4.5 million in inflow and infiltration fees to improve the capacity of the City's infrastructure.

As a significant 'line of first defense', the Project's stormwater improvements are intended to limit stormwater discharge into the City's system that will, in turn, discharge to the MBTA stormwater system when conditions allow. An agreement between the City and the MBTA allows for the design and construction of this connection by the City. Before the system is operational, however, permitting by MassDEP will be completed, and sewer separation within the City needs to be completed so that separated stormwater can be directed to the City's future pump station. Design of the pump station is anticipated to commence in 2019, and the pump station is anticipated to be operational in 2021.

The MBTA stormwater system is designed to pump stormwater from the City infrastructure in all storm events until stormwater levels reach an elevation six inches below the commuter rail tracks. As flood levels approach the six-inch threshold, the pump rate will slowly decrease, and pumping will stop when water levels reach the six-inch threshold. As water levels decrease below the six-inch threshold, the pump rate will increase again.

Upon reaching an elevation six inches below the commuter rail tracks, stormwater that cannot be pumped by the MBTA system will (as in the existing condition) flow by gravity to the Massachusetts Water Resources Authority (MWRA) storm sewer system and will ultimately be pumped to the Deer Island Wastewater Treatment Plant. US2 has discussed the operation of the pumping station with the City, and both parties acknowledge that the agreement with the MBTA will result in, during most storm events, the diversion of stormwater from combined sewer systems that ultimately flow to Deer Island, or that result in combined sewer overflows, to the MBTA's stormwater system. The percentage of the overall volume of stormwater to be diverted to the MBTA's system during various storm events is not determined at this time, and will be dependent on a number of factors including the completion of City sewer separation projects that are ongoing and that are planned, and whether the pump station that will discharge flow to the MBTA's system will be designed with its own storage tank, and if so, the volume of storage that will be provided. US2 will continue to coordinate with the City as required through Project implementation to ensure that Project stormwater management systems appropriately connect to the City's evolving and improving stormwater management system.

4.3 On-site Resiliency and Stormwater Management Measures

Stormwater management facilities will be implemented on a Lot-by-Lot basis and will conform, to the maximum extent practicable, to all Stormwater Management Standards within the Massachusetts Stormwater Handbook. The on-site mitigation measures will decrease the peak rate of runoff for all storm events up to and including the 100-year storm event. By doing so, these on-site measures will provide relief to the existing (and proposed) City infrastructure, and ultimately the MBTA stormwater mitigation system.

The Project will also be required to comply with the City's Infiltration and Inflow program, which will reduce the total volume of flow into the combined sewer system. During large storm events, the City's combined sewer system becomes surcharged with a combination of stormwater and sanitary sewage, and street flooding can result. The reduction of flows in the combined sewer system will help to reduce capacity issues during large storm events and make that system more resilient.

The design of many of the individual Lots will include new green spaces, green roofs, blue roofs, pervious paving and/or new tree canopy that will contribute to reducing downstream stormwater impacts. As described in Section 1.2.4.4, the largest open space is planned on D1, in part, because that location was specifically identified by the City as a location prone to storm risks.

Each Lot has site-specific conditions that may limit the construction of certain stormwater management facilities. However, each Lot will be evaluated for the feasibility of constructing subsurface infiltration facilities and permeable surfaces where soil conditions permit. If soil conditions limit site permeability, for example, subsurface detention facilities will be evaluated with the incorporation of an on-site stormwater pumping system to limit the discharge in all storm events up to and including the 100-year storm event.

The design of each Lot will incorporate appropriate stormwater resiliency features to protect buildings and the property, as well as abutting properties. Those features will include:

- First floor elevations, and electrical and mechanical equipment and systems, will be above predicted 100-year storm elevations or protected through perimeter curbing.
- Water tight utility conduits.
- A sanitary sewage overflow tank will be provided on Lots that are prone to flooding during large storm events as a result of the capacity of the combined sewer system, allowing sanitary sewage flows to be temporarily stored on site during storm events when the sewer system is surcharged. A check valve will also be installed to prevent flow from the surcharged combined sewer system from backing up into the site.
- Finish materials will meet the National Flood Insurance Program's (NFIP) Class Rating 4-5 ("acceptable") standard.
- In the most flood prone locations, the full perimeter of the building (e.g., Building D2.1) will include a flood foundation curb extending one foot above the ground floor elevation. Temporary flood gates will be employed at critical building openings during major storm events.

Coordination with the City is ongoing and will continue throughout the development of the Project.

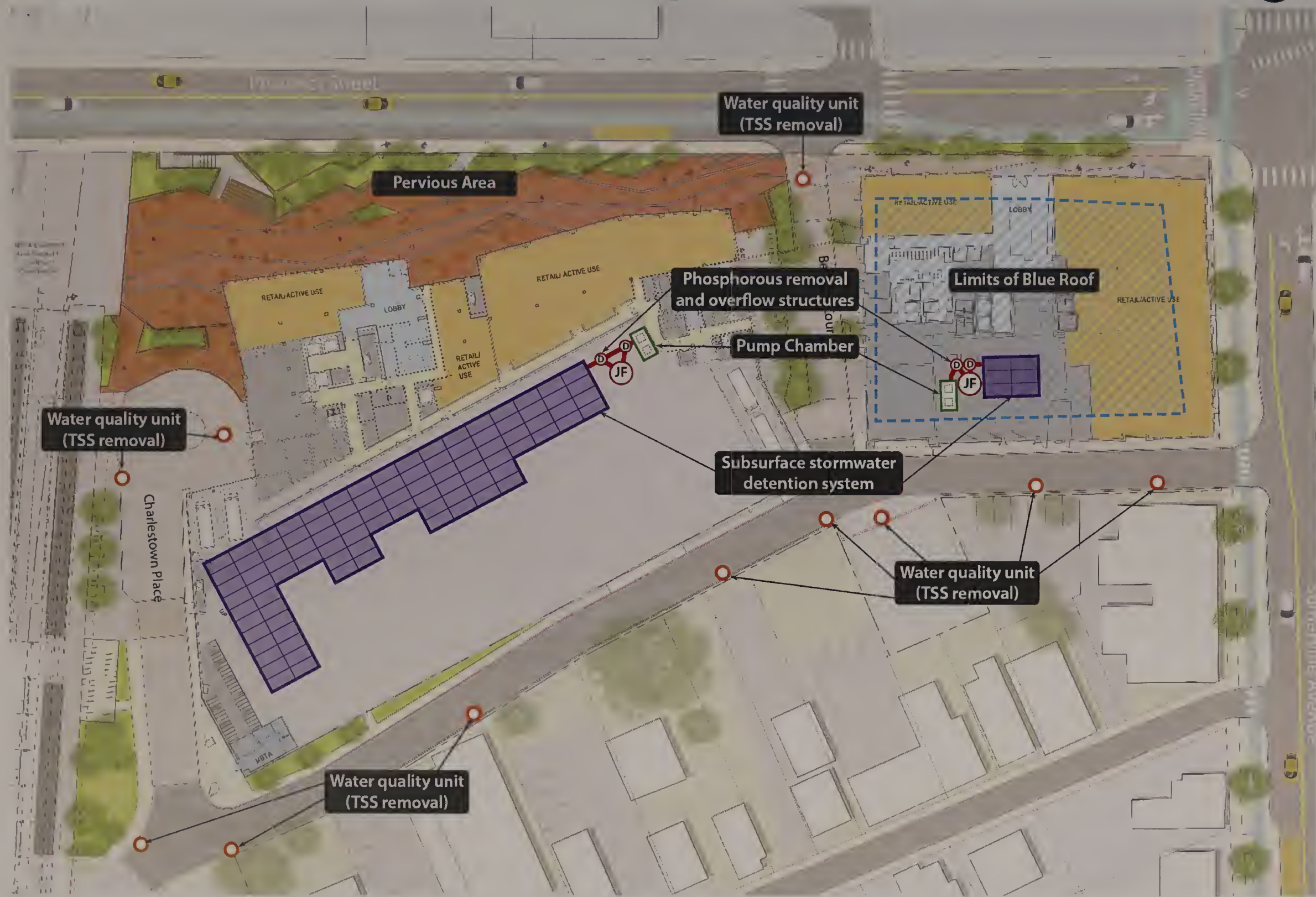
D2 Stormwater Management

As requested by MEPA at a recent meeting, additional details regarding the D2 stormwater management system are provided herein. On D2, stormwater will be treated and detained prior to discharge to the City's stormwater system. Stormwater management systems on D2 will include blue roofs, permeable pavement, two stormwater detention systems, and water quality structures for total suspended solids and phosphorous removal (see Figure 4-1).

The first stormwater detention system will be beneath the building on D2.1, and will manage stormwater from the entire D2.1 roof. A portion of the roof for D2.1 will be a blue roof, storing and detaining runoff, with an overflow to the stormwater detention system. Discharge from the detention system will be routed through a water quality device to remove phosphorus, and then will be pumped to the City's stormwater system in Somerville Avenue.

Stormwater runoff from the remainder of D2 will be directed to the second stormwater detention system located beneath the proposed parking garage. Permeable pavers located on the western side of the D2.2/D2.3 buildings will reduce the amount of surface runoff generated. Prior to discharge to the detention system, all surface runoff from vehicular pavement areas and those areas draining onto the vehicular pavement areas will be treated to remove total suspended

solids. Discharge from the detention system will be routed through a water quality device to remove phosphorus, and then will be pumped to the City's stormwater system in Somerville Avenue.



Note: Subject to review and approval.

Union Square Somerville, Massachusetts

Figure 4-1
Proposed D2 Stormwater Management

Mitigation and Proposed Section 61 Findings

5.0 MITIGATION AND PROPOSED SECTION 61 FINDINGS

5.1 Mitigation Measures

The Project's mitigation measures can be categorized as: a master-planned approach to Project planning that emphasizes Smart Growth planning principles; proactive transportation-related measures that are enforceable, such as the Mobility Management Plans and the GLX-specific mitigation; streetscape and infrastructure mitigation; financial contributions that allow the City to determine what measures will best meet their goals while improving Union Square; Lot and building specific measures related to new civic open spaces, urban design improvements, housing, greenhouse gas emissions reductions, remediation, resilience, water conservation and stormwater management; and a Community Benefits Agreement to be negotiated in good faith with the community-elected Union Square Neighborhood Council, the details of which are still being negotiated. Table A in Section 5.4 provides a list of anticipated mitigation, schedule for implementation and cost information.

Master Plan founded on Smart Growth Principles

The Project's master plan has been informed by a decade of community-driven planning processes that prioritized Smart Growth planning principles to ensure that the neighborhood's future is developed with an emphasis on repurposing underutilized land, expanding transit options and creating a more sustainable future. Each of the ten Smart Growth planning principles published by the EPA are evident in US2's plan, the combination of which will work to preserve the best of the neighborhood while enhancing its convenience, safety, health and environmental stewardship to stimulate economic growth that will sustain it for generations to come.

1. The Project's mix of land uses (approximately 60% commercial and 40% residential) will reduce vehicle trips, create vitality that support local business and improve safety.

2. The Project repurposes lower density, urban properties in lieu of sprawling greenfield development.

3. The Project's approximately 998 housing units will deliver a range of housing options and will contribute to regional goals to increase housing production and improve affordability.

4. The Project's design and the City's neighborhood infrastructure program are focused on prioritizing the pedestrian to create a more walkable neighborhood to reduce vehicle use.

5. The Project's plan is rooted in the values of the Union Square community that have been developed through community-driven planning processes and codified in the Neighborhood Plan and the Union Square Zoning.

6. The Project will create over 2.5 acres of new, publicly accessible open spaces that not only support varied programming but also increase resiliency, combat pollution and moderate temperature.

7. The Project will direct private investment to the existing Union Square community to improve outdated local infrastructure, enhance quality of life and expand the local commercial tax base.

8. The Project's multi-modal transportation focus means residents will have choices of alternative modes of travel due to new transit, vehicular, pedestrian and bicycle infrastructure investments.

9. The Project benefits from sustained City leadership that has been focused on neighborhood revitalization for more than a decade and has executed a strategic plan to bring transit, improve infrastructure and attract private sector participation in economic development.

10. The Project's planning process has embraced input from local residents, businesses and workers. The result is a plan for the future of the neighborhood rooted in diversity, strength of community, sustainability, innovation and a resilient economy while focusing on restoring Union Square to a commercial center.

Proactive Transportation-related Measures

Building on the multi-modal approach to Project transportation planning, the heart of the Project's transportation-related mitigation are the Mobility Management Plans and the GLX-specific mitigation. The Mobility Management Plans will be required for the development of each Lot and provide numerous measures with the intent to minimize vehicle trips. US2 has committed to a transportation monitoring program that will be used to determine the effectiveness of the Mobility Management Plans – if mode share goals are not being met, US2 will be required to implement additional measures. The effectiveness of the Mobility Management Plans is tied directly to the GLX project which will provide a more efficient transit connection to Boston and the surrounding communities. To assist the City's commitment to the GLX project which includes five new stations in Somerville, one of which serves Union Square, US2 is providing $5.8 million for the GLX project. In addition, D2 will include facilities essential to the full operation of Union Square Station at US2's expense, including end of line facilities inclusive of operator's breakroom, accessible restrooms, janitor's closet and The Ride paratransit service drop-off. The Project is contributing to the realization of the GLX, a cost-effective transportation alternative that alleviates traffic congestion, that will benefit the environment through reduced air pollution and greenhouse gas impacts, energy conservation and a reduction in petroleum dependence.

Streetscape and Infrastructure Mitigation

The Project is contributing to the realization of the City's streetscape and infrastructure master improvement plan for the Union Square neighborhood. Through a series of improvement projects, the City is addressing citywide legacy stormwater issues, upgrading dated utility infrastructure and improving several local streetscapes (see Section 1.4 for additional information regarding planned City Streetscape and Infrastructure improvements). Streetscape

improvements include a focus on Complete Streets that will widen sidewalks for pedestrians, improve bus routes, create new dedicated bike infrastructure and add green stormwater infrastructure. The current phase of the infrastructure program, the Somerville Avenue Utility and Streetscape project, is valued at $63 million and is currently ongoing.

The Project is supporting these infrastructure and streetscape projects by contributing $4.6 million or the equal value in in-kind improvements to the infrastructure program. In addition, US2s' commitment to construct D2 helped the City secure a $16 million MassWorks Infrastructure Grant. Lastly, the property taxes generated by the Project (more than $11.1 million per year) are expected to support the City's debt obligations for the infrastructure program.

Financial Contributions

The Project will be contributing over $36 million towards mitigating Project impacts and addressing City and community priorities. In addition to the $5.8 million for the GLX project and the $4.6 million for infrastructure and streetscape referenced above, the Project is providing approximately $4.5 million in inflow and infiltration payments, approximately $10.8 million in housing linkage, approximately $2.8 million in jobs linkage, approximately $3.9 million for a community benefits fund, approximately $0.4 million for rapid response transportation mitigation and approximately $3.4 million as a Future Phase mitigation contribution for transportation mitigation or other City and community needs.

Some of these funds are linked directly to a specific need (such as workforce development), but are not specifically linked to any program or project. Other funds, such as the $3.4 million Future Phase contribution, are not yet allocated to a specific need. This allows these funds to be directed to the mitigation programs at the City's discretion based on local priorities. For example, a portion of the funds could be used for new traffic signals if it is determined that such measures are necessary and desirable. The Future Phase mitigation contributions are in place of specific mitigation measures directly related to impacts, allowing the City flexibility in determining what measures are necessary or warranted. This is especially important since the City has a number of improvements projects that will be implemented in the Union Square area over the next seven years, and since details of some of these improvements are not determined, identifying specific mitigation measures at this time is not practical.

Lot and Building Specific Mitigation

The Project will include a number of mitigation measures related to each Lot and/or building. These mitigation measures include:

- Approximately 1,400,000 sf of new commercial development that will add approximately 5,200 new jobs to the neighborhood (making it truly mixed-use) and expanding the City's commercial tax base.

- Approximately 200 permanently affordable housing units on-site, in addition to the approximately $10.8 million in housing linkage funds mentioned above to support additional affordable housing in the City.

- Approximately 113,600 sf of new civic open spaces throughout the Project, providing spaces of varying types for the enjoyment and use of residents and visitors and the environmental benefits of new tree canopy and landscape areas.

- Improvements to the streetscape and pedestrian realm adjacent to the Blocks that will provide improved conditions for pedestrians and bicyclists.

- The large majority of the building area will be designed to LEED Gold standard (approximately 94% of the GFA) and the balance, any building less than 50,000 sf, will be designed to LEED Silver. Buildings will be designed to improve energy efficiency beyond requirements of base building code, reducing greenhouse gas emissions.

- Remediation of the Project sites to improve their conditions and allow the underutilized lots to be developed to support the goal of creating an economic center in Somerville.

- Designing buildings and civic open spaces to be resilient to the many impacts and conditions of climate change, including reduction of the urban heat island effect through new tree canopy and green infrastructure enhancements to increase resilience to flooding.

- Outdoor water use reductions through native and or adapted plants and irrigation efficiency.

- Indoor potable water use reductions through low-flow fixtures and other water conservation measures consistent with LEED goals.

- Support for improving the existing stormwater management conditions in Union Square through permeable paving to promote on-site infiltration.

Community Benefits Agreement

US2 is in the process of finalizing the negotiation of a Community Benefits Agreement with the community-elected Union Square Neighborhood Council. Since the filing of the ENF, US2 has been meeting regularly with the negotiating committee of the Union Square Neighborhood Council (including over 25 meetings) to work towards a community benefits agreement. Benefit discussions have included ideas focused on housing affordability; workforce; sustainability; small and sustainable business; green and open space; arts and creative economy; parking and traffic and indoor civic space. Some of the specific community benefits that were requested by the Union Square Neighborhood Council as part of the ongoing negotiation and that mitigate Project environmental impacts have been added to Table A below.

5.2 Anticipated State Permits and Approvals

Table 5-1 identifies the Agencies that are expected to take Agency Action on the proposed Project and, therefore, issue Section 61 Findings. It also identifies the Agency Actions anticipated to be required.

Table 5-1 List of Anticipated State Actions

Agency Name	Permit / Approval / Review
Department of Environmental Protection	Sewer Connection Permit
	Cross Connection Permit (if required)
	Environmental Remediation (if required)
Department of Transportation	Chapter 40, Section 54A approval
Massachusetts Historical Commission	State Register Review
Department of Housing and Community Development	Approval of SRA land conveyances under Master Land Disposition Agreement for D2 Block and under Land Disposition Agreements for other Lots
Massachusetts Water Resources Authority	Temporary Construction Dewatering Permit (if required)
	Industrial Use Discharge Permit (if required)
Somerville Redevelopment Authority	Completion of land acquisition process pursuant to Master Land Disposition Agreement with SRA
	Land Disposition Agreements with SRA for each individual lot other than lots for the development of D2 Block, and completion of land acquisition process thereunder

5.3 Proposed Section 61 Finding

M.G.L. c. 30, s. 61 requires that "[a]ll authorities of the Commonwealth ... review, evaluate, and determine the impact on the natural environment of all works, projects or activities conducted by them and ... use all practicable means and measures to minimize [their] damage to the environment. ... Any determination made by an agency of the Commonwealth shall include a finding describing the environmental impact, if any, of the project and a finding that all feasible measures have been taken to avoid or minimize said impact." Each state agency that issues a permit for the Project shall issue a Section 61 Finding in connection with permit issuance, identifying mitigation that is relied upon to satisfy the Section 61 requirement. A proposed Section 61 Finding is provided in this section, and a table of mitigation measures is included as part of the Section 61 Finding. All mitigation will be the responsibility of US2.

Project Name:	Union Square Redevelopment
Project Location:	Union Square, Somerville, MA
Project Proponent:	Union Square RELP Master Developer LLC and Somerville Redevelopment Authority
EEA Number:	15889
Date Noticed in Monitor:	July 11, 2018

The potential environmental impacts of the Project have been characterized and quantified in the ENF dated July 2, 2018, the DEIR dated January 15, 2019, and the FEIR dated [DATE] which are incorporated by reference into this Section 61 Finding. Throughout the planning and environmental review process, the Proponent has been working to develop measures to mitigate significant impacts of the Project. With the mitigation proposed and carried out in cooperation with state agencies, the [Agency] finds that there are no significant unmitigated impacts.

The Proponent recognizes that the identification of effective mitigation, and implementation of that mitigation throughout the life of the Project, is central to its responsibilities under the Massachusetts Environmental Policy Act (MEPA). The Proponent has accordingly prepared the annexed Table of Impacts and Mitigation Measures that specifies the mitigation that the Proponent will provide.

Now, therefore, [Agency], having reviewed the MEPA filings for the Project, including the mitigation measures itemized on the annexed Table of Impacts and Mitigation Measures, finds pursuant to M.G.L. C. 30, S. 61 that with the implementation of the aforesaid measures, all practicable and feasible means and measures will have been taken to avoid or minimize potential damage from the Project to the environment.

_____

[AGENCY]

_____

By

_____

[Date]

To be attached: Table A, describing the measures by construction phase to be implemented to mitigate the effects of the Project related to the required state permits and the schedule for implementation.

Phase 1 (D2.1, D2.2/D2.3)

Mitigation	Schedule	Estimated Cost
Transportation		
Neighborhood Mobility Management		
Phase 1 is consistent with a mixed-use master plan founded on Smart Growth principles that locates jobs, housing, services and transit in close proximity to reduce vehicle trips.	Part of master planning and planning for each lot	Part of Project cost
Mobility Management Plan will prioritize alternative modes of transport and reduce demand for personal vehicles, which may include, but are not limited to the following: ♦ On-site car sharing; ♦ Transit passes; ♦ Preferential parking for LEV/FEV vehicles; ♦ Preferential parking for carpool/vanpool; ♦ Carpool matching; ♦ Alternative schedules; ♦ Flexible hours; ♦ Marketing and education regarding available programs and incentives; ♦ EV charging stations; ♦ EV ready spaces; ♦ Guaranteed Ride Home Program; ♦ Secure bicycle parking, repair facilities and shower and changing facilities; ♦ Telecommuting; ♦ Real-time availability indicators, shared bicycles and repair facilities, etc.; ♦ Participation in a Transportation Management Association to help administer TDM programs; ♦ Coordination with the Assembly Square Transportation Management Association; and ♦ Designation of a TDM-Coordinator for each new commercial building to coordinate with other organizations within Union Square, unless the subject property is a member of a transportation management association.	Provided concurrent with development review for each individual building	Part of Project cost

Phase 1 (D2.1, D2.2/D2.3) (continued)

Mitigation	Schedule	Estimated Cost
Transportation (continued)		
Mobility Management Plan obligations will be included to the extent possible as part of the lease language between tenants and the property owner.	Prior to the issuance of the Certificate of Occupancy of a space leased by a tenant with 50 or more employees	Part of Project cost
Neighborhood Mobility Management (continued)		
Annual reporting will be conducted to track, assess, and report on the implementation of the Mobility Management Plan as required by the Somerville Zoning Ordinance and the Planning Board's Mobility Management Plan Submittal Standards.	During Phase 1 operation	Part of Project cost
US2 will join MBTA Perq Program.	Completed	Part of Project cost
US2 will require the commercial tenants, as part of their lease, to participate in the MBTA Perq program (or propose some equivalent substitute) so long as MBTA Perq continues to exist and without substantial changes.	Prior to the issuance of the Certificate of Occupancy of a space leased by a tenant with 50 or more employees	Part of Project cost
New mid-block thoroughfare to improve neighborhood permeability and circulation.	Concurrent with the development of Phase 1	Part of Project cost
Contribution to off-site infrastructure (or in-kind improvements) to renew neighborhood utilities and 'Complete Streets' streetscape improvements. This item is also included in Utility Infrastructure mitigation below.	Concurrent with the development of each Lot	$1.2 million
Rapid response mitigation funds for short-term mobility and safety mitigation.	Concurrent with the development of each Lot	$60,700
The Project is providing the private investment required to support the $16 million in MassWorks grants the City of Somerville received for streetscape, transportation and infrastructure improvements, including raised protected bicycle lanes on Somerville Avenue.	Concurrent with Phase 1 development	$325 million investment in D2
Transit		
Green Line Extension (GLX) transit contribution. GLX will significantly reduce vehicle trips and related air emissions while increasing access to fast and reliable public transit service in historically underserved areas.	Concurrent with the development of each Lot	$1.5 million
Union Square Station improvements and end of line facilities inclusive of operator's breakroom, accessible restrooms, janitor's closet and The Ride paratransit service drop-off.	Part of D2.2/D2.3 construction	Part of Project cost

Phase 1 (D2.1, D2.2/D2.3) (continued)

Mitigation	Schedule	Estimated Cost
Transportation (continued)		
A permanent volumetric easement in favor of the MBTA for construction and for operating a portion of the GLX Union Square Station on a portion of the D2 site.	Prior to GLX Station Opening	Part of Project cost
Easement rights to accommodate the MBTA elevator at no cost to the MBTA, and/or a contribution to the cost of the installation of the MBTA elevator.	Prior to GLX Station Opening	To be determined
Transit (continued)		
ADA-compliant pedestrian path from Union Square Station to the Prospect Street sidewalk at Bennett Court to improve pedestrian access to transit.	Part of D2.2/D2.3 construction	Part of Project cost
The existing bus stop on Prospect Street between D2.1 and D2.2 will be improved for accessibility and comfort.	Concurrent with the development of Phase 1	Part of Project cost
Pedestrian		
Minimum of 12-foot-wide sidewalks along Somerville Avenue and Prospect Street frontages.	Concurrent with the development of Phase 1	Part of Project cost
A minimum of 20,100 sf of civic open space that serve as extensions of the public realm to provide pedestrian-prioritized connectivity to neighborhood opportunities.	Concurrent with the development of Phase 1	Part of Project cost
Cyclist		
Approximately 558 bicycle parking spaces for short-term and long-term stays.	Concurrent with the development of Phase 1	Part of Project cost
120 bicycle parking spaces adjacent to Union Square Station (90 sheltered and secured bicycle spaces within a fully accessible, secure enclosure and 30 additional short-term parking spaces outside of the enclosure).	Concurrent with the development of D2.2/D2.3	Part of Project cost
Parking Management		
Construction and operation of a shared commercial parking facility that centrally and efficiently manages parking demand across a range of Project uses.	Part of D2.3/D2.3 development	Part of Project cost

Phase 1 (D2.1, D2.2/D2.3) (continued)

Mitigation	Schedule	Estimated Cost
Transportation (continued)		
Parking management may include, but will not be limited to, the following: ♦ "Unbundled" parking: all residents and employers at the Project site must purchase and/or lease parking separately from any office and/or residential space. ♦ Market Rate Pricing: Parking for both residential and commercial uses will be available at local market rates. ♦ Limited dedicated parking: Reserved parking will be limited to encourage the efficient use of all parking spaces.	Concurrent with the development of the associated Lots	Part of Project cost
Parking Management (continued)		
♦ Daily Pricing: When practical and feasible, employers will be encouraged to provide parking at daily rates rather than monthly leases. ♦ Real time availability indicators.		
Construction		
US2 will produce a Construction Management Plan for review by the City that will detail the schedule, staging, truck routes, parking and other associated impacts of the construction Project.	During Phase 1 construction	Part of Project cost
US2 will convene a Construction Task Force, to include representatives from Union Square Main Streets, relevant City departments, and US2 which shall meet regularly during construction to develop and implement construction period impacts.	During Phase 1 construction	Part of Project cost
Utility Infrastructure		
Contribution to off-site infrastructure (or in-kind of improvements) to renew neighborhood utilities and streetscape.	Concurrent with the development of each Lot	Included in Neighborhood Mobility Management above
The Project is providing the private investment required to support the $16 million in MassWorks grants the City of Somerville received for streetscape, transportation and infrastructure improvements.	Concurrent with D2 development	$325 million investment in D2
Inflow and infiltration fees that offset any increases in sewage flows at a 4:1 ratio in compliance with City of Somerville policies.	Concurrent with receipt of Certificate of Occupancy for each building Lot	$1.4 million

Phase 1 (D2.1, D2.2/D2.3) (continued)

Mitigation	Schedule	Estimated Cost
Utility Infrastructure (Continued)		
Infrastructure to allow for detention and infiltration on site, alleviating pressure on City systems, and the reduction in duration and extent of localized flooding.	Concurrent with development of Phase 1	Part of Project cost
Civic open space area to achieve a minimum of 70% pervious area to promote stormwater infiltration.	Concurrent with development of the Phase 1 civic open space	Part of Project cost
Water conserving fixtures throughout the Project, consistent with LEED standards.	Concurrent with the development of each Lot	Part of Project cost
Hazardous Wastes		
Environmental remediation of Lots as required by federal and state requirements to support proposed uses.	Concurrent with Phase 1 construction	Part of Project cost
Sustainable Design and Climate Change Preparedness		
See Transportation Measures above for Mobile Source GHG Mitigation.		
Phase 1 buildings will be LEED certifiable under LEED BD+C v4 meeting the Gold standard.	Concurrent with the development of each Lot	Part of Project cost
Phase 1 shall include the following mitigation elements: ♦ An estimated 13.5% reduction in stationary source GHG emissions from baseline, as baseline is defined in the DEIR; ♦ High performance building envelopes; ♦ Light or reflective roofs; ♦ Exterior shade devices; ♦ Heat or Energy Recovery; ♦ Demand-controlled ventilation; ♦ Reduced lighting power densities; ♦ High-efficiency HVAC equipment; ♦ High performance exterior lighting; ♦ Energy Star appliances; ♦ PV-Ready buildings; ♦ Low-flow fixtures; ♦ Recycling collection areas; ♦ and Construction waste recycling.	As applicable for each building	Part of Project cost

Phase 1 (D2.1, D2.2/D2.3) (continued)

Mitigation	Schedule	Estimated Cost
Sustainable Design and Climate Change Preparedness (Continued)		
Green Vehicle Infrastructure will be incorporated in the D2.2/D2.3 commercial garage including approximately: ♦ 14 preferred spaces for low emitting vehicles / fuel efficient vehicles; ♦ 10 electric vehicle charging parking spaces; ♦ 10 electric vehicle 'ready' parking spaces; ♦ 5 spaces reserved for carpools; and ♦ 2 spaces reserved for car share.	Concurrent with the development of D2.2/D2.3	Part of Project cost
100% of Phase 1 building energy needs will be procured from a qualified resource for green power, carbon offsets or renewable energy certificates for a period of 10 years.	During Phase 1 Project operation	Part of Project cost
Construct all Phase 1 buildings to be 'solar' ready.	During Phase 1 construction	Part of Project cost
A minimum of approximately 10,200 sf of roof area will be 'set-aside' for the potential for PV arrays that may be installed and aggregated in the future.	During Phase 1 construction	Part of Project cost
Increased vegetative cover and cool pavements, where feasible, to reduce the urban heat island effect.	Concurrent with the development of each Lot	Part of Project cost
A minimum of approximately 20,100 sf of publicly accessible civic open space that includes 70% pervious materials.	Concurrent with the development of Phase 1	Part of Project cost
Contributions to the urban tree canopy by planting many large trees with soil volumes and/or structural soils that promote growth to full maturity.	Concurrent with the development of the D2.2/D2.3 civic open space	Part of Project cost
The designs of each Lot will address the potential for flood impacts, and structures will be designed to protect critical building systems from flood risks. Flood sensitive systems will not be located in areas that are deemed to be susceptible to flooding without the necessary precautions to protect them.	Concurrent with the development of each Lot	Part of Project cost
D2.1 will incorporate a blue roof as part of its stormwater management program.	Concurrent with the development of D2.1	Part of Project cost
D2.2/D2.3 will incorporate green roof areas on the top of the parking structure to mitigate the urban heat island effect, reduce stormwater runoff and improve air quality.	Concurrent with the development of D2.2/D2.3	Part of Project cost
The D2.1, D2.2/D2.3 designs will aim to locate critical energy systems above the 500-year floodplain.	Concurrent with the development of each Lot	Part of Project cost

Phase 1 (D2.1, D2.2/D2.3) (continued)

Mitigation	Schedule	Estimated Cost
Additional Overall Project Mitigation		
Approximately 179,000 sf of new commercial space that will help restore Union Square as an employment center, create a mix of uses, provide approximately 500 jobs and increase the commercial tax base (all *SomerVision* goals) by $1 million annually.	Concurrent with D2.1	Part of Project cost
Creation of approximately 90 permanently affordable housing units.	Concurrent with D2.2/D2.3	Part of Project cost
Housing linkage payments to create additional affordable housing.	Payment to be made concurrent with the development of D2.1	$1.5 million
Approximately 13,000 sf of arts and creative enterprise space designated to support and foster Union Square's creative economy.	Concurrent with D2.2/D2.3	Part of Project cost
Jobs linkage payments to fund workforce development programs and economic mobility for Somerville residents.	Concurrent with the development of D2.1	$228,000
Community Benefits Agreement to be negotiated in good faith with the community-elected Neighborhood Council, with any agreement to include additional provisions/requirements.	Subject to agreement of both parties	To be determined
Community Benefits fund to address community priorities.	Concurrent with the development of each building Lot	$1 million

Phase 2 (D1.1, D3.1)

Mitigation	Schedule	Estimated Cost
Transportation		
Neighborhood Mobility Management		
Phase 2 is consistent with a mixed-use master plan founded on Smart Growth principles that locates jobs, housing, services and transit in close proximity to reduce vehicle trips.	Part of master planning and planning for each lot	Part of Project cost
Mobility Management Plan that will elevate alternative modes of transport and reduce demand for personal vehicles, which may include, but are not limited to the following: ♦ On-site car sharing; ♦ Transit passes; ♦ Preferential parking for LEV/FEV vehicles;	Provided concurrent with development review for each individual building	Part of Project cost

Phase 2 (D1.1, D3.1) (continued)

Mitigation	Schedule	Estimated Cost
Transportation (continued)		
♦ Preferential parking for carpool/vanpool; ♦ Carpool matching; ♦ Alternative schedules; ♦ Flexible hours; ♦ Marketing and education regarding available programs and incentives; ♦ EV charging stations; ♦ EV ready spaces;		
Neighborhood Mobility Management (continued)		
♦ Guaranteed Ride Home Program; ♦ Secure bicycle parking, repair facilities and shower and changing facilities; ♦ Bike sharing; ♦ Telecommuting; ♦ Real-time availability indicators, shared bicycles and repair facilities, etc.; ♦ Participation in a Transportation Management Association to help administer TDM programs; ♦ Coordination with the Assembly Square Transportation Management Association; and ♦ Designation of a TDM Coordinator for each new commercial building to coordinate with other organizations within Union Square, unless the subject property is a member of a transportation management association.		
Mobility Management Plan obligations will be included to the extent possible as part of the lease language between tenants and the property owner.	Prior to the issuance of the Certificate of Occupancy of a space by a tenant with 50 or more employees	Part of Project cost
Annual reporting will be conducted to track, assess, and report on the implementation of the Mobility Management Plan as required by the Somerville Zoning Ordinance and the Planning Board's Mobility Management Plan Submittal Standards.	During operation	Part of Project cost

Phase 2 (D1.1, D3.1) (continued)

Mitigation	Schedule	Estimated Cost
Transportation (continued)		
Contribution to off-site infrastructure (or in-kind improvements) to renew neighborhood utilities and 'Complete Streets' streetscape improvements. This item is also included in Utility Infrastructure mitigation below.	Concurrent with the development of each Lot	$750,000
Future Phase Mitigation Contribution which may be deployed by the City to address ongoing transportation mitigation needs and other neighborhood needs.	Concurrent with the development of each Lot	$750,000
Rapid response mitigation funds for short-term mobility and safety mitigation.	Concurrent with the development of each Lot	$76,800
Neighborhood Mobility Management (continued)		
US2 will require the commercial tenants, as part of their lease, to participate in the MBTA Perq program (or propose some equivalent substitute) so long as MBTA Perq continues to exist and without substantial changes.	Prior to the issuance of the Certificate of Occupancy of a space leased by a tenant with 50 or more employees	Part of Project cost
The hotel use will provide on demand shuttle service.	During operation of proposed hotel on D1.1	Part of operating cost
Two new mid-block thoroughfares to improve neighborhood permeability and circulation on Blocks D1 and D3.	Concurrent with the development of the Lots	Part of Project cost
Transit		
GLX transit contribution. GLX will significantly reduce vehicle trips and related air emissions while increasing access to fast and reliable public transit service in historically underserved areas.	Concurrent with the development of each Lot	$950,000
The existing bus stop on Webster Street in front of D3.1 will be improved for accessibility and comfort.	Concurrent with the development of D3.1	Part of Project cost
Pedestrian		
Minimum of 12-foot-wide sidewalks along Somerville Avenue, Prospect Street, Washington Street and Webster Street.	Concurrent with the development of each Lot	Part of Project cost
Approximately 16,000 sf of high-quality civic open space that serve as extensions of the public realm to provide pedestrian-prioritized connectivity to neighborhood opportunities.	Concurrent with the development of D3.1	Part of Project cost

Phase 2 (D1.1, D3.1) (continued)

Mitigation	Schedule	Estimated Cost
Transportation (continued)		
Cyclists		
Approximately 104 bicycle parking spaces for short-term and long-term stays on the Project site.	Concurrent with the development of each Lot	Part of Project cost
Bike share station and associated bicycles planned at a location to be coordinated with the City of Somerville.	Before the 4th building of the Project	Part of Project cost
Parking Management		
Construction of shared parking facilities that centrally and efficiently manage parking demand across a range of Project uses.	Concurrent with the development of the Lots	Part of Project cost
Parking management may include, but will not be limited to, the following: ♦ "Unbundled" parking: all residents and employers at the Project site must purchase and/or lease parking separately from any office and/or residential space. ♦ Market Rate Pricing: Parking for both residential and commercial uses will be available at local market rates. ♦ Limited dedicated parking: Reserved parking will be limited to encourage the efficient use of all parking spaces. ♦ Daily Pricing: When practical and feasible, employers will be encouraged to provide parking at daily rates rather than monthly leases. ♦ Real time availability indicators.	Concurrent with the development of the Lots	Part of Project cost
Construction		
US2 will produce a Construction Management Plan for review by the City that will detail the schedule, staging, truck routes, parking and other associated impacts of the construction Project.	During construction	Part of Project cost
US2 will convene a Construction Task Force, to include representatives from Union Square Main Streets, relevant City departments, and US2 which shall meet regularly during construction to develop and implement construction period impacts.	During construction	Part of Project cost

Phase 2 (D1.1, D3.1) (continued)

Mitigation	Schedule	Estimated Cost
Utility Infrastructure		
Contribution to off-site infrastructure (or in-kind improvements) to renew neighborhood utilities and streetscape.	Concurrent with the development of each Lot	Included in Neighborhood Mobility Management above
Inflow and infiltration fees that offset any increases in sewage flows at a 4:1 ratio in compliance with City of Somerville policies.	Concurrent with receipt of Certificate of Occupancy for each building Lot	$770,000
On-site stormwater management improvements to allow for detention and infiltration on site, alleviating pressure on City systems, and the reduction in duration and extent of localized flooding.	Concurrent with development of each Lot	Part of Project cost
The civic open space area will achieve a minimum of 70% pervious area to promote infiltration.	Concurrent with development of the civic open space on D3.1	Part of Project cost
Water conserving fixtures throughout the Project, consistent with LEED standards.	Concurrent with the development of each Lot	Part of Project cost
Hazardous Wastes		
Environmental remediation of Lots as required by federal and state requirements to support proposed uses.	Prior to construction	Part of Project cost
Sustainable Design and Climate Change Preparedness		
See Transportation Measures above for Mobile Source GHG Mitigation.		
Buildings will be LEED certifiable under LEED BD+C v4 meeting the Gold standard.	Concurrent with the development of each Lot	Part of Project cost
Phase 2 shall include the following mitigation elements: ♦ An estimated 14.9% reduction in stationary source GHG emissions from baseline, as baseline is defined in the DEIR; ♦ High performance building envelopes; ♦ Light or reflective roofs; ♦ Exterior shade devices;	As applicable for each building	Part of Project cost

Phase 2 (D1.1, D3.1) (continued)

Mitigation	Schedule	Estimated Cost
Sustainable Design and Climate Change Preparedness (continued)		
♦ Heat or Energy Recovery; ♦ Demand-controlled ventilation; ♦ Reduced lighting power densities; ♦ High-efficiency HVAC equipment; ♦ High performance exterior lighting; ♦ Energy Star appliances; ♦ PV-Ready buildings; ♦ Low-flow fixtures; ♦ Recycling collection areas; and ♦ Construction waste recycling		
Green Vehicle Infrastructure will be incorporated in the Phase 2 commercial garages including approximately: ♦ 17 preferred spaces for low emitting vehicles / fuel efficient vehicles; ♦ 10 electric vehicle charging parking spaces; ♦ 10 electric vehicle 'ready' parking spaces; ♦ 8 spaces for car pools; and ♦ 4 spaces reserved for car share.	Concurrent with the development with the commercial garages in Phase 2	Part of Project cost
Construct all Phase 2 buildings to be 'solar' ready.	During Phase 2 construction	Part of Project cost
A minimum of approximately 6,700 sf of combined roof area will be 'set-aside' for the potential for PV arrays that may be installed and aggregated in the future.	During Phase 2 construction	Part of Project cost
Increased vegetative cover, green roofs, cool roofs, and cool pavements, where feasible, to reduce the urban heat island effect.	Concurrent with the development of each Lot	Part of Project cost
Approximately 16,000 sf of civic open space improvements.	Concurrent with the development of the Lots	Part of Project cost
Contributions to the urban tree canopy by planting many large trees with soil volumes and/or structural soils that promote growth to full maturity.	Concurrent with the development of each Lot	Part of Project cost

Phase 2 (D1.1, D3.1) (continued)

Mitigation	Schedule	Estimated Cost
Sustainable Design and Climate Change Preparedness (continued)		
The designs of each Lot will address the potential for flood impacts, and structures will be designed to protect critical building systems from flood risks. Flood sensitive systems will not be located in areas that are deemed to be susceptible to flooding without the necessary precautions to protect them.	Concurrent with the development of each Lot	Part of Project cost
Each Lot design will aim to locate critical energy systems above the 500-year floodplain.	Concurrent with the development of each Lot	Part of Project cost
Additional Overall Project Mitigation		
Approximately 291,000 sf of new commercial space along with an approximately 175-room hotel that restores Union Square as an employment center, create a mix of uses, provides approximately 730 jobs and adds approximately $2.6 million in annual commercial tax revenue (all *SomerVision* goals).	Concurrent with the development of each Lot	Part of Project cost
Housing linkage payments to create additional affordable housing.	Payment to be made concurrent with the development of each Lot	$3.2 million
Jobs linkage payments to fund workforce development programs and economic mobility for Somerville residents.	Concurrent with the development of each Lot	$870,000
Community Benefits Agreement to be negotiated in good faith with the community-elected Neighborhood Council, with any agreement to include additional provisions/requirements.	Subject to agreement of both parties	To be determined
Community Benefits fund to address community priorities.	Concurrent with the development of each building Lot	$630,000

Phase 3 – South (D3.2, D3.3, D4.1, D4.2, D4.3)

Mitigation	Schedule	Estimated Cost
Transportation		
Neighborhood Mobility Management		
Phase 3 - South is consistent with a mixed-use master plan founded on Smart Growth principles that locates jobs, housing, services and transit in close proximity to reduce vehicle trips.	Part of master planning and planning for each Lot	Part of Project cost
Mobility Management Plan that will elevate alternative modes of transport and reduce demand for personal vehicles, which may include, but are not limited to the following: ♦ On-site car sharing; ♦ Transit passes; ♦ Preferential parking for LEV/FEV vehicles; ♦ Preferential parking for carpool/vanpool;	Provided concurrent with development review for each individual building	Part of Project cost
Neighborhood Mobility Management (continued)		
♦ Carpool matching; ♦ Alternative schedules; ♦ Flexible hours; ♦ Marketing and education regarding available programs and incentives; ♦ EV charging stations; ♦ EV ready spaces; ♦ Guaranteed Ride Home Program; ♦ Secure bicycle parking, repair facilities and shower and changing facilities; ♦ Bike sharing; ♦ Telecommuting; ♦ Real-time availability indicators, shared bicycles and repair facilities, etc.; ♦ Participation in a Transportation Management Association to help administer TDM programs; ♦ Coordination with the Assembly Square Transportation Management Association; and		

Phase 3 – South (D3.2, D3.3, D4.1, D4.2, D4.3) (continued)

Mitigation	Schedule	Estimated Cost
Transportation (continued)		
♦ Designation of a TDM Coordinator for each new commercial building to coordinate with other organizations within Union Square, unless the subject property is a member of a transportation management association.		
Mobility Management Plan obligations will be included to the extent possible as part of the lease language between tenants and the property owner.	Prior to the issuance of the Certificate of Occupancy of a space by a tenant with 50 or more employees	Part of Project cost
Annual reporting will be conducted to track, assess, and report on the implementation of the Mobility Management Plan as required by the Somerville Zoning Ordinance and the Planning Board's Mobility Management Plan Submittal Standards.	During operation	Part of Project cost
Neighborhood Mobility Management (continued)		
Contribution to off-site infrastructure (or in-kind improvements) to renew neighborhood utilities and 'Complete Streets' streetscape improvements. This item is also included in Utility Infrastructure mitigation below.	Concurrent with the development of each Lot	$1.4 million
Future Phase Mitigation Contribution which may be deployed by the City to address ongoing transportation mitigation needs and other neighborhood needs.	Concurrent with the development of each Lot	$1.4 million
Rapid response mitigation funds for short-term mobility and safety mitigation.	Concurrent with the development of each Lot	$139,800
US2 will require the commercial tenants, as part of their lease, to participate in the MBTA Perq program (or propose some equivalent substitute) so long as MBTA Perq continues to exist and without substantial changes.	Prior to the issuance of the Certificate of Occupancy of a space leased by a tenant with 50 or more employees	Part of Project cost
New mid-block thoroughfare on D3 to improve neighborhood permeability and circulation.	Concurrent with the development of the associated Lots on D3	Part of Project cost
Transit		
GLX transit contribution. GLX will significantly reduce vehicle trips and related air emissions while increasing access to fast and reliable public transit service in historically underserved areas.	Concurrent with the development of each Lot	$1.7 million

Phase 3 – South (D3.2, D3.3, D4.1, D4.2, D4.3) (continued)

Mitigation	Schedule	Estimated Cost
Transportation (continued)		
The existing bus stop on Newton Street and Webster Avenue adjacent to lot D4.3 will be improved for accessibility and comfort.	Concurrent with the development of D4.3	Part of Project cost
Pedestrian		
Minimum of 12-foot-wide sidewalks along Prospect Street and Webster Street.	Concurrent with the development of each Lot with frontage on a pedestrian street	Part of Project cost
Approximately 27,800 sf of high-quality civic open spaces that serve as extensions of the public realm to provide pedestrian-prioritized connectivity to neighborhood opportunities.	Concurrent with the development of the Lot that the open space is a part of	Part of Project cost
A new pedestrian way along a to-be-vacated portion of Newton Street that facilitates neighborhood pedestrian desire lines.	Concurrent with the development of D4.3	Part of Project cost
Cyclists		
Approximately 590 bicycle parking spaces for short-term and long-term stays on the Project site.	Concurrent with the development of each Lot	Part of Project cost
One bike share station and associated bicycles.	Before the 7th building of the Project	Part of Project cost
Parking Management		
Construction of shared parking facilities that centrally and efficiently manage parking demand across a range of Project uses.	Concurrent with the development of the associated Lots on D3	Part of Project cost
Parking management may include, but will not be limited to, the following: ♦ "Unbundled" parking: all residents and employers at the Project site must purchase and/or lease parking separately from any office and/or residential space. ♦ Market Rate Pricing: Parking for both residential and commercial uses will be available at local market rates. ♦ Limited dedicated parking: Reserved parking will be limited to encourage the efficient use of all parking spaces. ♦ Daily Pricing: When practical and feasible, employers will be encouraged to provide parking at daily rates rather than monthly leases.	Concurrent with the development of the associated Lots on D3	Part of Project cost

Phase 3 – South (D3.2, D3.3, D4.1, D4.2, D4.3) (continued)

Mitigation	Schedule	Estimated Cost
Transportation (continued)		
♦ Real time availability indicators.		
Construction		
US2 will produce a Construction Management Plan for review by the City that will detail the schedule, staging, truck routes, parking and other associated impacts of the construction Project.	During construction	Part of Project cost
US2 will convene a Construction Task Force, to include representatives from Union Square Main Streets, relevant City departments, and US2 which shall meet regularly during construction to develop and implement construction period impacts.	During construction	Part of Project cost
Utility Infrastructure		
Contribution to off-site infrastructure (or in-kind improvements) to renew neighborhood utilities and streetscape.	Concurrent with the development of each Lot	Included in Neighborhood Mobility Management above
Inflow and infiltration fees that offset any increases in sewage flows at a 4:1 ratio in compliance with City of Somerville policies.	Concurrent with receipt of Certificate of Occupancy for each building Lot	$1.3 million
Infrastructure to allow for detention and infiltration on site, alleviating pressure on City systems, and the reduction in duration and extent of localized flooding.	Concurrent with development of each Lot	Part of Project cost
All civic open space areas to achieve a minimum of 70% pervious area to promote infiltration.	Concurrent with development of each civic open space	Part of Project cost
Water conserving fixtures throughout the Project, consistent with LEED standards.	Concurrent with the development of each Lot	Part of Project cost
Hazardous Wastes		
Environmental remediation of Lots as required by federal and state requirements to support proposed uses.	Prior to construction on each Lot requiring remediation	Part of Project cost

Phase 3 – South (D3.2, D3.3, D4.1, D4.2, D4.3) (continued)

Sustainable Design and Climate Change Preparedness		
See Transportation Measures above for Mobile Source GHG Mitigation.		
Phase 3 - South buildings greater than 50,000 sf will be LEED certifiable under LEED BD+C v4 meeting the Gold standard, and buildings less than 50,000 sf will be LEED certifiable under LEED BD+C v4 meeting the Silver standard.	Concurrent with the development of each Lot	Part of Project cost
Construct D4.3 multi-family building as a Passive House project.	Concurrent with Construction of D4.3	Part of Project cost
Phase 3 - South shall include the following mitigation elements: ♦ An estimated 14.4% reduction in stationary source GHG emissions from baseline, as baseline is defined in the DEIR; ♦ High performance building envelopes; ♦ Light or reflective roofs; ♦ Exterior shade devices; ♦ Heat or Energy Recovery; ♦ Demand-controlled ventilation; ♦ Reduced lighting power densities; ♦ High-efficiency HVAC equipment; ♦ High performance exterior lighting; ♦ Energy Star appliances; ♦ PV-Ready buildings; ♦ Low-flow fixtures; ♦ Recycling collection areas; and ♦ Construction waste recycling.	As applicable for each building	Part of Project cost
Green Vehicle Infrastructure will be incorporated in the Phase 3 South commercial garages including approximately: ♦ 16 preferred spaces for low emitting vehicles / fuel efficient vehicles; ♦ 6 electric vehicle charging parking spaces; ♦ 6 electric vehicle 'ready' parking spaces; ♦ 5 spaces reserved for carpools; and ♦ 2 spaces reserved for car share.	Concurrent with the development with the commercial garages in Phase 3 - South	Part of Project cost

Phase 3 – South (D3.2, D3.3, D4.1, D4.2, D4.3) (continued)

Mitigation	Schedule	Estimated Cost
Sustainable Design and Climate Change Preparedness (continued)		
Construct all Phase 3 buildings to be 'solar' ready.	During Phase 3 - South construction	Part of Project cost
A minimum of approximately 9,600 sf of combined roof area will be 'set-aside' for the potential for PV arrays that may be installed and aggregated in the future.	During Phase 3 – South construction	Part of Project cost
Increased vegetative cover, green roofs, cool roofs, and cool pavements, where feasible, to reduce the urban heat island effect.	Concurrent with the development of each Lot	Part of Project cost
Approximately 54,800 sf of civic open space improvements.	Concurrent with the development of the Lots that the civic open space is a part of	Part of Project cost
Approximately 27,000 sf Neighborhood Park adjacent to D1.2 to be constructed in an area of higher risk for climate impacts for flooding risk and urban heat island effect.	No later than when 50% of the overall development square footage has started construction	Part of Project cost
Contributions to the urban tree canopy by planting many large trees with soil volumes and/or structural soils that promote growth to full maturity.	Concurrent with the development of each Lot	Part of Project cost
The designs of each Lot will address the potential for flood impacts, and structures will be designed to protect critical building systems from flood risks. Flood sensitive systems will not be located in areas that are deemed to be susceptible to flooding without the necessary precautions to protect them.	Concurrent with the development of each Lot	Part of Project cost
Each Lot design will aim to locate critical energy systems above the 500-year floodplain.	Concurrent with the development of each Lot	Part of Project cost
Additional Overall Project Mitigation		
Approximately 312,000 sf of new commercial spaces that restore Union Square as an employment center, create a mix of uses, provide approximately 1,500 jobs and generate $1.7 million annually to the commercial tax base (all *SomerVision* goals).	Concurrent with each commercial building	Part of Project cost
Creation of approximately 85 permanently affordable housing units.	Concurrent with D3.2 and D4.3	Part of Project cost
Housing linkage payments to create additional affordable housing.	Payment to be made concurrent with the development of each commercial building greater than 30,000 sf	$2.3 million

Phase 3 – South (D3.2, D3.3, D4.1, D4.2, D4.3) (continued)

Mitigation	Schedule	Estimated Cost
Additional Overall Project Mitigation		
Approximately 15,000 sf of arts and creative enterprise space designated to support and foster Union Square's creative economy.	Concurrent with D3.2 and D3.3	Part of Project cost
Jobs linkage payments to fund workforce development programs and economic mobility for Somerville residents.	Concurrent with the development of each commercial building greater than 30,000 sf	$640,000
Community Benefits Agreement to be negotiated in good faith with the community-elected Neighborhood Council, with any agreement to include additional provisions/requirements.	Subject to agreement of both parties	To be determined
Community Benefits fund to address community priorities.	Concurrent with the development of each building Lot	$1.2 million

Phase 3 – North (D1.2, D2.4, D5.2, D5.3, D6.1, D6.2, D7.1, D7.2)

Mitigation	Schedule	Estimated Cost
Transportation		
Neighborhood Mobility Management		
Phase 3 - North is consistent with a mixed-use master plan founded on Smart Growth principles that locates jobs, housing, services and transit in close proximity to reduce vehicle trips.	Part of master planning and planning for each Lot	Part of Project cost
Mobility Management Plan that will elevate alternative modes of transport and reduce demand for personal vehicles, which may include, but are not limited to the following: ♦ On-site car sharing; ♦ Transit passes; ♦ Preferential parking for LEV/FEV vehicles; ♦ Preferential parking for carpool/vanpool; ♦ Carpool matching; ♦ Alternative schedules; ♦ Flexible hours; ♦ Marketing and education regarding available programs and incentives; ♦ EV charging stations; ♦ EV ready spaces;	Provided concurrent with development review for each individual building	Part of Project cost

Phase 3 – North (D1.2, D2.4, D5.2, D5.3, D6.1, D6.2, D7.1, D7.2) (Continued)

Mitigation	Schedule	Estimated Cost
Transportation		
♦ Guaranteed Ride Home Program; ♦ Secure bicycle parking, repair facilities and shower and changing facilities; ♦ Bike sharing; ♦ Telecommuting; ♦ Real-time availability indicators, shared bicycles and repair facilities, etc.; ♦ Participation in a Transportation Management Association to help administer TDM programs; ♦ Coordination with the Assembly Square Transportation Management Association; and ♦ Designation of a TDM Coordinator for each new commercial building to coordinate with other organizations within Union Square, unless the subject property is a member of a transportation management association.		
Neighborhood Mobility Management (continued)		
Mobility Management Plan obligations will be included to the extent possible as part of the lease language between tenants and the property owner.	Prior to the issuance of the Certificate of Occupancy of a space by a tenant with 50 or more employees	Part of Project cost
Annual reporting will be conducted to track, assess, and report on the implementation of the Mobility Management Plan as required by the Somerville Zoning Ordinance and the Planning Board's Mobility Management Plan Submittal Standards.	During operation	Part of Project cost
Contribution to off-site infrastructure (or in-kind improvements) to renew neighborhood utilities and 'Complete Streets' streetscape improvements. This item is also included in Utility Infrastructure mitigation below.	Concurrent with the development of each Lot	$1.3 million
Future Phase Mitigation Contribution which may be deployed by the City to address ongoing transportation mitigation needs and other neighborhood needs.	Concurrent with the development of each Lot	$1.3 million
Rapid response mitigation funds for short-term mobility and safety mitigation.	Concurrent with the development of each Lot	$134,200

Phase 3 – North (D1.2, D2.4, D5.2, D5.3, D6.1, D6.2, D7.1, D7.2) (continued)

Mitigation	Schedule	Estimated Cost
Transportation (continued)		
US2 will require the commercial tenants, as part of their lease, to participate in the MBTA Perq program (or propose some equivalent substitute) so long as MBTA Perq continues to exist and without substantial changes.	Prior to the issuance of the Certificate of Occupancy of a space leased by a tenant with 50 or more employees	Part of project cost
Transit		
GLX transit contribution. GLX will significantly reduce vehicle trips and related air emissions while increasing access to fast and reliable public transit service in historically underserved areas.	Concurrent with the development of each Lot	$1.7 million
Three existing bus stops in Phase 3 - North will be improved for accessibility and comfort: one on Washington Street adjacent lot D1.2, a second fronting lot D7.2, and a third on Somerville Avenue adjacent lot D6.2.	Concurrent with the development of the specified Lots	Part of Project cost
Pedestrians		
Minimum of 12-foot-wide sidewalks along Somerville Avenue, Prospect Street, Washington Street and Bow Street frontages.	Concurrent with the development of each development Lot with frontage on pedestrian street	Part of Project cost
Approximately 22,700 sf of high-quality civic open spaces that serve as extensions of the public realm to provide pedestrian-prioritized connectivity to neighborhood opportunities.	Concurrent with the development of the Lot that the civic open space is a part of	Part of Project cost
A new mid-block pedestrian way that facilitates neighborhood pedestrian desire lines will be created between D6.1 and D6.2.	Concurrent with the development of D6	Part of Project cost
Cyclists		
Approximately 346 bicycle parking spaces for short-term and long-term stays on the Project site.	Concurrent with the development of each Lot	Part of Project cost
Parking Management		
Construction of shared parking facilities that centrally and efficiently manage parking demand across a range of Project uses.	Concurrent with the development of the associated Lots D1.2 and D6	Part of Project cost

Phase 3 – North (D1.2, D2.4, D5.2, D5.3, D6.1, D6.2, D7.1, D7.2) (continued)

Mitigation	Schedule	Estimated Cost
Transportation (continued)		
Parking management may include, but will not be limited to, the following: ♦ "Unbundled" parking: all residents and employers at the Project site must purchase and/or lease parking separately from any office and/or residential space. ♦ Market Rate Pricing: Parking for both residential and commercial uses will be available at local market rates. ♦ Limited dedicated parking: Reserved parking will be limited to encourage the efficient use of all parking spaces. ♦ Daily Pricing: When practical and feasible, employers will be encouraged to provide parking at daily rates rather than monthly leases. ♦ Real time availability indicators.	Concurrent with the development of the associated Lots on D1.2 and D6	Part of Project cost
Construction		
US2 will produce a Construction Management Plan for review by the City that will detail the schedule, staging, truck routes, parking and other associated impacts of the construction Project.	During construction	Part of Project cost
US2 will convene a Construction Task Force, to include representatives from Union Square Main Streets, relevant City departments, and US2 which shall meet regularly during construction to develop and implement construction period impacts.	During construction	Part of Project cost
Utility Infrastructure		
Contribution to off-site infrastructure (or in-kind improvements) to renew neighborhood utilities and streetscape.	Concurrent with the development of each Lot	Included in Neighborhood Mobility Management above
Inflow and infiltration fees that offset any increases in sewage flows at a 4:1 ratio in compliance with City of Somerville policies.	Concurrent with receipt of Certificate of Occupancy for each building Lot	$1.0 million
Infrastructure to allow for detention and infiltration on site, alleviating pressure on City systems, and the reduction in duration and extent of localized flooding.	Concurrent with development of each Lot	Part of Project cost

Phase 3 – North (D1.2, D2.4, D5.2, D5.3, D6.1, D6.2, D7.1, D7.2) (continued)

Mitigation	Schedule	Estimated Cost
Utility Infrastructure (Continued)		
All civic open space areas to achieve a minimum of 70% pervious area to promote infiltration.	Concurrent with development of each civic open space	Part of Project cost
Water conserving fixtures throughout the Project, consistent with LEED standards.	Concurrent with the development of each Lot	Part of Project cost
Hazardous Wastes		
Environmental remediation of Lots as required by federal and state requirements to support proposed uses.	Prior to construction on each Lot requiring remediation	Part of Project cost
Sustainable Design and Climate Change Preparedness		
See Transportation Measures above for Mobile Source GHG Mitigation.		
Phase 3 - North buildings greater than 50,000 sf will be LEED certifiable under LEED BD+C v4 meeting the Gold standard, and buildings less than 50,000 sf will be LEED certifiable under LEED BD+C v4 meeting the Silver standard.	Concurrent with the development of each Lot	Part of Project cost
Phase 3 - North shall include the following mitigation elements: ♦ An estimated 14% reduction in stationary source GHG emissions from baseline, as baseline is defined in the DEIR, for the Project as a whole; ♦ High-performance building envelopes; ♦ Light or reflective roofs; ♦ Exterior shade devices; ♦ Heat or Energy Recovery; ♦ Demand-controlled ventilation; ♦ Reduced lighting power densities; ♦ High-efficiency HVAC equipment; ♦ High performance exterior lighting; ♦ Energy Star appliances; ♦ PV-Ready buildings; ♦ Low-flow fixtures; ♦ Recycling collection areas; and ♦ Construction waste recycling.	As applicable for each building	Part of Project cost

Phase 3 – North (D1.2, D2.4, D5.2, D5.3, D6.1, D6.2, D7.1, D7.2) (continued)

Mitigation	Schedule	Estimated Cost
Sustainable Design and Climate Change Preparedness (continued)		
Green Vehicle Infrastructure will be incorporated in the Phase 3 – North commercial garages including approximately: ♦ 25 preferred spaces for low emitting vehicles / fuel efficient vehicles; ♦ 12 electric vehicle charging parking spaces; ♦ 12 electric vehicle 'ready' parking spaces; ♦ 11 spaces reserved for carpools; and ♦ 6 spaces reserved for car share.	Concurrent with the development with the commercial garages in Phase 3 - North	Part of Project cost
Construct all Phase 3 - North buildings to be 'solar' ready.	During Phase 3 - North construction	Part of Project cost
A minimum of approximately 13,500 sf of combined roof area will be 'set-aside' for the potential for PV arrays that may be installed and aggregated in the future.	During Phase 3 - North construction	Part of Project cost
Increased vegetative cover, green roofs, cool roofs, and cool pavements, where feasible, to reduce the urban heat island effect.	Concurrent with the development of each Lot	Part of Project cost
Approximately 22,700 sf of civic open space improvements.	Concurrent with the development of the Lots that the civic open space is a part of	Part of Project cost
Contributions to the urban tree canopy by planting many large trees with soil volumes and/or structural soils that promote growth to full maturity.	Concurrent with the development of each Lot	Part of Project cost
The designs of each Lot will address the potential for flood impacts, and structures will be designed to protect critical building systems from flood risks. Flood sensitive systems will not be located in areas that are deemed to be susceptible to flooding without the necessary precautions to protect them.	Concurrent with the development of each Lot	Part of Project cost
Each Lot design will aim to locate critical energy systems above the 500-year floodplain.	Concurrent with the development of each Lot	Part of Project cost
Additional Overall Project Mitigation		
Approximately 524,000 sf of new commercial spaces that restore Union Square as an employment center, create a mix of uses, provide approximately 2,500 jobs and increase the commercial tax base by $2.9 million annually (all *SomerVision* goals).	Concurrent with each commercial building	Part of Project cost

Phase 3 – North (D1.2, D2.4, D5.2, D5.3, D6.1, D6.2, D7.1, D7.2) (continued)

Mitigation	Schedule	Estimated Cost
Additional Overall Project Mitigation (continued)		
Creation of approximately 25 permanently affordable housing units.	Concurrent with D5.2, D7.1 and D7.2	Part of Project cost
Housing linkage payments to create additional affordable housing.	Payment to be made concurrent with the development of each commercial building greater than 30,000 sf	$3.8 million
Approximately 26,000 sf of arts and creative enterprise space designated to support and foster Union Square's creative economy.	Concurrent with D1.2, D2.4, D6.1 and D6.2	Part of Project cost
Jobs linkage payments to fund workforce development programs and economic mobility for Somerville residents.	Concurrent with the development of each commercial building greater than 30,000 sf	$1.1 million
Community Benefits Agreement to be negotiated in good faith with the community-elected Neighborhood Council, with any agreement to include additional provisions/requirements.	Subject to agreement of both parties	To be determined
Community Benefits fund to address community priorities.	Concurrent with the development of each building Lot	$1.1 million

Response to DEIR Comments

6.0 RESPONSE TO DEIR COMMENTS

6.1 Introduction

This Chapter provides responses to the Certificate on the DEIR and the associated comment letters that were received on the DEIR filed with the MEPA Office on January 15, 2019. The letters have been reproduced and individual comments coded in the margins. Following each individual letter are direct responses to each comment that has been identified and can be matched to the comment code in the letter's margin; references to sections of the FEIR that provide more details related to the response are provided where appropriate. Table 6-1 provides a list of letters with comments received and the comment identifier. Letters in support of the Project are included at the end of the chapter.

Table 6-1 Certificate and Comment Letters

Certificate of the Secretary of Energy and Environmental Affairs	MEPA
Department of Environmental Protection	DEP
Department of Energy Resources	DOER
Department of Transportation	DOT
Massachusetts Water Resources Authority	MWRA
Metropolitan Area Planning Council	MAPC
City of Somerville	CS
Union Square Neighborhood Council	USNC
Tori Antonio	TA
Bill Cavellini	BC
Stephen Kaiser	SK
Paola Massoli	PM
Somerville Catholic Collaborative	SCC
Somerville Bicycle Advisory Committee	SBAC
Pennie Taylor	PT
Union United	UU
Rachel Weil	RW
Wig Zamore	WZ

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

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LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

March 8, 2019

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS ON THE DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Union Square Redevelopment
PROJECT MUNICIPALITY	: Somerville
PROJECT WATERSHED	: Charles River
EEA NUMBER	: 15889
PROJECT PROPONENT	: Somerville Redevelopment Authority and Union Square RELP Master Developer LLC
DATE NOTICED IN MONITOR	: January 23, 2019

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62I) and Section 11.08 of the MEPA regulations (301 CMR 11.00), I have reviewed the Draft Environmental Impact Report (DEIR) and hereby determine that it **adequately and properly complies** with MEPA and its implementing regulations. The Proponent may prepare and submit for review a Final Environmental Impact Report (FEIR).

The project is the result of extensive planning efforts by the City of Somerville (City) that have identified broad, long-term goals, such as sustainability and economic development, that are tailored to each neighborhood. The project has been conceived of as a transit-oriented development (TOD) planned in close coordination with the Massachusetts Bay Transportation Authority's (MBTA) Green Line Extension (GLX) to Union Square (EEA# 13886). GLX is under construction and scheduled to open in 2021.

I received numerous comments from municipal officials, State and regional agencies and residents. Many comments, including those from the City, expressed strong support for the project. I

also received comments noting that the DEIR lacked detail in its responses to comments submitted on the Expanded Environmental Notification Form (EENF) and in regard to parcels to be developed in later phases, the design and amount of open space, and access to Union Square Station. Commenters recommended that the Proponent adopt a more aggressive approach to minimizing the project's Greenhouse Gas (GHG) emissions through energy-efficient building design and on-site renewable energy generation. Commenters also requested that the Proponent provide clear and binding commitments for all mitigation measures, including measures to encourage transit use by residents and visitors to the site.

MEPA is an environmental review process through which the Proponent will identify potential environmental impacts, consider alternatives to avoid impacts, and propose mitigation measures. It does not approve or deny a project. A key purpose of MEPA is to "assist each Agency in using (in addition to applying any other applicable statutory and regulatory standards and requirements) all feasible means to avoid Damage to the Environment or, to the extent Damage to the Environment cannot be avoided, to minimize and mitigate Damage to the Environment to the maximum extent practicable" (301 CMR 11.01(1)(a)). I note that many concerns about the design of the project will continue to be reviewed as part of the City's approval of the project.

Project Description

The project consists of the redevelopment of seven parcels totaling 15.1 acres. The project is a component of the City's Union Square Urban Revitalization Plan (URP) that was reviewed by MEPA in 2013 (EEA# 15032). The project includes approximately 2.36 million square feet (sf) of mixed uses in 17 new buildings. It will provide 1,495 parking spaces, public open space and pedestrian and vehicular access to support the GLX and Union Square Station. The development program is detailed in Table 1.

The Proponent's Master Land Disposition Agreement (MLDA) with the Somerville Redevelopment Authority (SRA) requires that 50 percent of the project be completed no later than ten years after the opening of the GLX, 75 percent must be completed within 15 years of the GLX opening and 100 percent of the must be completed within 20 years of the opening of the GLX. The DEIR identified construction of the project in three phases:

- Phase 1: Three buildings with a gross floor area (GFA) of 607,000 sf and 290 parking spaces on Lots D2.1, D2.2 and D2.3;
- Phase 2: Two new buildings with a GFA of 384,000 sf and 320 parking spaces on Lots D1.1 and D3.1; and,
- Phase 3: Twelve buildings with a GFA of 1,370,000 sf and 885 parking spaces on lots D1.2, D2.4, D3.2, D3.3, D5.2, D5.3 and parcels 4, 6 and 7.

The Phase 1 site is adjacent to the proposed Union Square Station. It will include a 15,000-sf plaza and other pedestrian facilities providing access to the station from Prospect Street, including: access compliant with the Americans with Disabilities Act (ADA); a drop off/pick up area for The Ride, the MBTA's paratransit service; bicycle parking; and interior space for MBTA employees.

Table 1- Development Program (sf)

Parcel	Total	Arts	Residential	Office/ Lab	Hotel	Retail	Open Space	# Parking spaces
D1.1	104,000	-	-	-	93,000	11,000	-	50
D1.2	248,000	6,000	-	231,000	-	11,000	27,000	385
D2.1	178,000	-	-	166,000	-	12,000	-	-
D2.2-2.3	429,000	13,000	399,000		-	17,000	15,100	290
D2.4	12,000	12,000	-	-	-		7,100	-
D3.1	280,000	-	-	271,000	-	9,000	16,000	270
D3.2	351,000	9,000	333,000	-	-	9,000	8,200	-
D3.3	257,000	6,000	-	251,000	-	-	3,700	300
D4.1	30,000	-	-	25,000	-	5,000	3,400	-
D4.2	0	-	-	-	-	-	6,000	-
D4.3	61,000	-	54,000	-	-	7,000	6,500	25
D5.2	25,000	-	-	21,000	-	4,000	-	-
D5.3	33,000	-	30,000	-	-	3,000	-	15
D6.1	112,000	4,000	-	96,000	-	12,000	-	55
D6.2	115,000	4,000	-	97,000	-	14,000	9,100	55
D7.1	45,000	-	40,000	-	-	5,000	-	20
D7.2	81,000	-	77,000	-	-	4,000	6,500	30
Total	2,361,000	54,000	933,000	1,158,000	93,000	123,000	108,600	1,495

Background

Following the completion of its SomerVision Comprehensive Plan (Somervision), the City finalized the Union Square URP and it was approved by votes of the Board of Aldermen, Planning Board and the SRA in 2012. It was submitted to the Massachusetts Department of Housing and Community Development (DHCD) pursuant to M.G.L. 121B, Housing and Urban Renewal, and the Urban Renewal Regulations at 760 CMR 12.00. The URP was approved by DHCD in 2013. An Environmental Notification Form (ENF) was submitted for MEPA review in 2013. In a Certificate issued on April 19, 2013, the Secretary determined that the URP did not require additional MEPA review and that individual development projects within the URP area may require MEPA review.

The URP covers an area of 117 acres including the project site (which was identified as the "Prospect/Webster Corridor"), the Boynton Yards area south of the MBTA commuter rail tracks and the McGrath/Medford Corridor in the eastern part of the URP area. The seven lots comprising the project site are among the acquisition and disposition parcels identified to facilitate redevelopment within the URP. The estimated build-out of the project presented in the URP is consistent with that proposed in the DEIR. The Phase 1 site ("North Prospect Block") was identified as a key parcel for acquisition and disposition because it would provide easements necessary to construct the GLX.

As recommended in the SomerVision plan, the City completed the Union Square Neighborhood Plan in 2015. The Neighborhood Plan included a review of development alternatives for the project site,

and identified an overall massing and mix of uses for the project. The Neighborhood Plan served as the basis for zoning changes adopted by the City in 2017. The SRA executed a Master Land Disposition Agreement (MLDA) with the developer that outlined the purchase terms and development conditions for the Phase 1 site and the acquisition and development process for subsequent phases.

Project Site

Union Square is a densely-developed, mixed-use neighborhood in southeastern Somerville. The project site includes the following seven development parcels with a combined area of 15.1 acres:

- D1: A 2.53-acre parcel consisting of lots D1.1 and D1.2 bordered by Washington Street to the north, Prospect Street to the west, Somerville Avenue to the south and Merriam Street to the east. The parcel has multiple owners and is occupied by the Somerville Public Safety Building, a two-family home and commercial uses;
- D2: A 4.18-acre parcel consisting of lots D2.1, D2.2, D2.3 and D2.4 bordered by Prospect Street to the west, Somerville Avenue to the north, the MBTA commuter rail tracks to the south and residences on Allen Street to the east. The parcel is owned by the SRA and the City of Somerville and is largely vacant;
- D3: A 4.12-acre parcel consisting of lots D3.1, D3.2 and D3.3 bordered by the MBTA commuter rail tracks to the north, Prospect Street and Webster Street to the west, Columbia Street and Windsor Place to the south and a commercial building to the east. The parcel is occupied by a vacant warehouse and a commercial use and is privately owned.
- D4: Three non-contiguous parcels designated as D4.1, D4.2 and D4.3 with a combined area of 1.08 acres. They are generally located along Prospect Street north and south of the MBTA tracks. The parcel is privately owned and occupied by commercial uses;
- D5: Two non-contiguous parcels designated as D5.2 and D5.3 with a combined area of approximately 0.5 acres located on the north side of Somerville Avenue on either side of its intersection with Columbus Avenue. The lots are privately owned with vacant commercial buildings.
- D6: A 1.58-acre parcel consisting of lots D6.1 and D6.2 bordered by Somerville Avenue to the north, Prospect Street to the east, Everett Street to the south and parcels along Webster Avenue to the west. The site is privately owned and occupied by commercial uses; and
- D7: A 1.14-acre parcel consisting of lots D7.1 and D7.2 on the north side of Bow Street and bisected by Warren Avenue. The lots are privately owned by and occupied by commercial uses and a bank.

According to the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM) numbers 25017C0438E and 25017C0439E (both maps effective June 4, 2010), the project site is not located in a 100-year floodplain. However, the DEIR indicated that parcels D1, D2 and D3 are low-lying and prone to flooding.

Environmental Impacts and Mitigation

Potential environmental impacts associated with the project include the net addition of 1.15 acres of impervious area, generation of 27,963 average daily trips (adt), 1,495 parking spaces, the use of 280,970 gallons per day (gpd) of water, and generation of 280,970 gpd of wastewater. The addition of

impervious area will increase the volume of stormwater runoff. GHG emissions and air pollutants are associated with on-site energy use and transportation.

The project has been planned to maximize use of public transportation, walking and bicycling for travel to and from the site and in coordination with future transportation and infrastructure projects to be completed by the City and the Massachusetts Department of Transportation (MassDOT). The project will contribute to the completion of the Union Square Station by providing pedestrian and bicycle facilities, a drop-off area for The Ride, and a financial contribution toward the cost of the GLX. It will include stormwater management systems that meet the Massachusetts Department of Environmental Protection's (MassDEP) Stormwater Management Standards (SMS). It will minimize water use through water-conserving plumbing and the Proponent will coordinate with the City to develop the project, including the remediation of hazardous material in accordance with MGL c. 21E and the Massachusetts Contingency Plan (MCP). The project will include measures to increase energy efficiency and minimize GHG emissions. Construction-period mitigation measures will include sedimentation and erosion controls, designated truck routes, measures to reduce air pollutants from construction vehicles, and noise, dust and odor controls.

Jurisdiction and Permitting

The project is subject to the preparation of a Mandatory EIR pursuant to the MEPA regulations because it requires State Agency Actions and will generate 3,000 or more new adt on roadways providing access to a single location (301 CMR 11.03(6)(a)(6)) and construct 1,000 or more new parking spaces at a single location (301 CMR 11.06(a)(7)). The Full Build project also meets or exceeds the ENF thresholds at 310 CMR 11.03(5)(b)(4)(a), new discharge or expansion in discharge to a sewer system of 100,000 or more gpd of sewage, industrial waste water or untreated stormwater and 301 CMR 11.03(10)(b)(1), demolition of all or any exterior part of any Historic Structure listed in or located in any Historic District listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth.

The project requires a Land Transfer by the SRA which is a municipal redevelopment agency created or acting in accordance with M.G.L. c. 121A or c. 121B. It requires an approval from MassDOT pursuant to MGL c.40 s.54A for the use of land formerly used as a railroad right-of-way (ROW). The project is subject to the May 2010 MEPA Greenhouse Gas Emissions Policy and Protocol (GHG Policy) and will require a Public Benefit Determination (PBD).

The project requires a National Pollutant Discharge Elimination System (NPDES) Stormwater General Permit from the United States Environmental Protection Agency (EPA) and a Determination of Non-Hazard to Air Navigation from the Federal Aviation Administration (FAA).

Because the project requires a Land Transfer, MEPA jurisdiction is broad and extends to all aspects of the project that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations.

Changes Since the EENF

Since the filing of the EENF, the project has been slightly reduced in size as a result of eliminating parcel D5.1 from the development program. As proposed in the EENF, the project would have included the renovation of the former post office building on this parcel to provide 20,000 sf of arts-related uses and 17,000 sf of retail space. According to the DEIR, parcel D5.1 has been acquired by another party who will redevelop the site. Because parcel D5.1 is included within the URP, the SRA and the proponent of the parcel D5.1 redevelopment should consult with the MEPA office regarding the need for additional MEPA review.

Review of the DEIR

According to the DEIR, the Proponent does not own all of the parcels and is unable to provide detailed information on those parcels. The DEIR reviewed existing conditions and provided a description of the project, including the size and proposed use of each building and plans showing the location of the development parcels and open and civic spaces. The Phase 1 buildings have been advanced to a 60 percent designed level; all other buildings are at the 10 percent design level. I note that the DEIR included only schematic plans of building designs and uses, even for the three buildings that are at a more advanced design stage. The DEIR identified the project's impacts on transportation, air quality, infrastructure and water quality. It provided an analysis of the project's GHG emissions and climate change resiliency. The DEIR included a Response to Comments received on the EENF, identified mitigation commitments and provided draft Section 61 Findings. I note that the draft Section 61 Findings were not detailed and did not provide estimated costs or a schedule for implementation of mitigation measures. It identified the statutory and regulatory standards and requirements applicable to the project and reviewed the status of the project's review by the City.

Land

The project is a redevelopment project and will not alter undisturbed land. Approximately 3.6 acres (157,000 sf) of the 15.1-acre project site will be publicly accessible exterior space, including open spaces, sidewalks and roadways. The project will provide approximately 2.5 acres (108,600 sf) of exterior civic space and open space, including a 0.6-acre (27,000 sf) park along Somerville Avenue and Merriam Street, a 15,100-sf (0.35 acres) plaza along Prospect Street, a 16,000-sf (0.37 acres) open space along Prospect Street and Webster Avenue and other smaller open space areas throughout the site.

The City/SRA owns the D2 block. The other parcels are privately owned. According to the MLDA, the Proponent is required to make good faith efforts to purchase the parcels, but the SRA may take parcels by eminent domain if necessary and convey them to the Proponent. Because the Proponent does not own all the parcels, the DEIR did not include detailed plans of existing and proposed conditions. According to the DEIR, existing ground elevations range from 3.3 ft NGVD 29 at the site of Union Square Station to approximately 20 ft NGVD 29 on parcel D5, with an average elevation of 13.1 ft NGVD 29. Final grades will be determined during final design and will depend on ADA accessibility, vehicular access/egress, resiliency measures and other factors.

Twelve parcels on blocks D1, D2, D3, D4 and D7 are subject to railroad rights-of-way (ROW) and other easements. Pursuant to MGL Chapter 40 section 54A, MassDOT must consent to the issuance

of building permits on eight parcels with railroad ROWs. The parcels are generally located adjacent to the existing railroad tracks.

Alternatives Analysis

The DEIR provided an alternatives analysis that quantified environmental impacts of two alternatives described in the EENF and a Reduced Build alternative. The Residential and Commercial alternatives were evaluated as part of the City's planning process for Union Square and would provide a different mix of residential, retail, office and research/lab space within an overall development of 2.3 million sf. The Residential alternative would include 1.725 million sf of residential use, 115,000 sf of retail, 230,000 sf of office and 230,000 sf of research/lab space. The Commercial alternative would include 345,000 sf of residential space, 115,000 sf of retail, 920,000 sf of office space and 920,000 sf of research/lab space. The Reduced Build alternative would provide 600,000 sf of residential use, 123,000 sf of retail space, 523,000 sf of office, 785,000 sf of research/lab space and a 93,000-sf hotel, with a total development program of 2.12 million sf.

The Residential and Commercial alternatives would have similar levels of impacts with respect to GHG emissions and hazardous waste. According to the DEIR, these alternatives are not compliant with zoning and are not consistent with the Coordinated Development Special Permit (CDSP) issued for the project. The Reduced Build alternative would generate significantly fewer vehicle trips and have lower emissions of air pollutants associated with vehicle use than the Preferred and Commercial alternatives, would use less water and generate less wastewater than the Preferred and residential alternatives and would have similar impacts on stationary-source GHG emissions and hazardous waste remediation. According to the DEIR, the Reduced Build alternative is compliant with zoning for the site but is not consistent with the CDSP.

According to the DEIR, the Preferred Alternative was selected to provide the balanced mix of uses that were identified as being preferable during the City's planning process. It indicated that the Preferred Alternative will provide the level of commercial space that will achieve planning goals for economic development and is most consistent with zoning for Union Square. The DEIR also indicated that the Preferred Alternative will minimize the number of parking spaces because the development program consists of complementary uses that support shared parking.

Transportation

The DEIR included a transportation study prepared consistent with the EEA/Massachusetts Department of Transportation (MassDOT) *Transportation Impact Assessment (TIA) Guidelines* issued in March 2014. It described existing and proposed roadway, pedestrian, and bicycle conditions, public transit capacity and infrastructure, roadway and intersection volumes and roadway safety issues. Many of the proposed roadway improvements included in the TIA have been or will be undertaken by the City. Analyses of pedestrian, bicycle, transit and vehicular operations were provided for the weekday morning and evening peak hours for Existing 2018, No Build 2025, and Build 2025 scenarios. These analyses were generally similar in format to those provided in the EENF for Phase 1, except for the transit analysis which was prepared according to guidance provided by the MBTA. The TIA identified mitigation measures, including pedestrian and bicycle accommodations, roadway improvements, transit service and TDM measures, which will be implemented to minimize impacts to the local transportation

network. The TIA analyzed the transportation impacts of the project in a study area including the following 37 intersections:

- Somerville Avenue at Bow Street;
- Bow Street at Summer Street;
- Bow Street at Wesley Park;
- Bow Street at Walnut Street;
- Somerville Avenue at Hawkins Street;
- Washington Street at Hawkins Street;
- Somerville Avenue at Bow Street and Warren Avenue;
- Washington Street at Somerville Avenue and Webster Avenue;
- Washington Street at Bonner Avenue;
- Washington Street at Columbus Avenue;
- Somerville Avenue at Linden Street;
- Somerville Avenue at Washington Street and Prospect Street;
- Prospect Street at Everett Street and future D2 Block site driveway;
- Webster Avenue at Newton Street;
- Webster Avenue at Prospect Street and Concord Avenue;
- Prospect Street at Oak Street;
- Webster Avenue at Tremont Street and Columbia Street;
- Washington Street at McGrath Highway;
- Somerville Avenue at Medford Street;
- Medford Street at South Street;
- Somerville Avenue at School Street;
- Columbus Avenue at Future D5 Block site driveway;
- Somerville Avenue at Allen Street and Future D1 Block site driveway;
- Somerville Avenue at Future D2 Block site driveway;
- Allen Street at Future D2 Block site driveway;
- Concord Avenue at Future D4 Block site driveway;
- Webster Avenue at Future D3 Block site driveway;
- Columbia Street at Windsor Place and Future D3 Block site driveway;
- Everett Street at Emerson Street;
- Webster Avenue at Everett Street;
- Cambridge Street at Prospect Street;
- Cambridge Street at Webster Avenue;
- Inman Square;
- Beacon Street at Concord Avenue; and,
- Beacon Street at Washington Street.

Trip Generation

The number of trips generated by the project was estimated using trip rates published by the Institute of Transportation Engineers (ITE) *Trip Generation Handbook* 10th Edition and trips were assigned to various transportation modes. Based on the ITE trip generation rates for land use codes

(LUC) 222 (Multifamily High-Rise), 820 (Shopping Center), 310 (Hotel) and 710 (Office), the project would generate 22,352 adt on a weekday.

The number of unadjusted trips was converted to person-trips using U.S. Census data for Somerville which indicate that the average vehicle occupancy is 1.25 people. Vehicle trips were reduced by 15 percent to account for internal capture trips, or trips taken between uses on the same site. These trips were converted to pedestrian trips. The person trips were adjusted to reflect transportation mode shares for each use. According to the TIA, the mode shares were established by the City with the assumption that the GLX and other multi-modal improvements will be completed and available to accommodate project-generated trips. Mode shares are anticipated to be 40 percent vehicle, 22 percent transit, 15 percent bicycle and 23 percent pedestrian.[1] The number of adjusted trips by each mode are summarized in Table 2.

Table 2. Project-generated Trips (adjusted) by Mode

Period	Transit	Walking	Bicycle	Vehicle
Weekday AM Peak	527	552	368	805
Weekday PM Peak	640	672	448	977
Weekday Daily	6,152	6,453	4,302	9,398
Saturday Peak	463	482	324	709

The TIA evaluated transportation operations under existing (2018) and future (2025) conditions. Existing 2018 conditions were established by collecting counts of pedestrians, bicyclists and vehicles at each intersection in the study area. It included an analysis of existing and future bus service in accordance with the MBTA's passenger comfort metric, as detailed below. The No Build 2025 scenario incorporated a 0.25 percent annual growth rate in vehicle and transit trips, a 1.0 percent annual growth rate in pedestrian and bicycle trips and additional trips generated by two planned development projects in the study area. The pedestrian, bicycle, transit and vehicular trips generated by the project were added to the No Build 2025 trips to establish the Build 2025 scenario.

The future conditions modelled in the TIA assumed that that the City will complete the following roadway improvements:

- Somerville Avenue: two-way traffic between Bow Street and Washington Street, including signalization of the Somerville Avenue at Bow Street intersection;
- Realignment and re-signalization of the Union Square intersection of Somerville Avenue/Washington Street/Bow Street/Warren Avenue;
- Bow Street: no free left or free right to Somerville Avenue;
- Hawkins Street: two-way traffic between Somerville Avenue and Washington Street, including signalization of each intersection;

[1] The DEIR (page 4-7) mistakenly stated that the existing auto mode share in Union Square is 38.8 percent. Data in Appendix B-1 indicated that the non-vehicular mode share is currently approximately 38.8 percent and the existing auto mode share is approximately 60 percent. During the review period, the Proponent confirmed that the information in Appendix B-1 is correct.

- Warren Avenue: two-way traffic between Bow Street and Somerville Avenue;
- Washington Street at Somerville Avenue and Webster Avenue: no left turns from Washington Street eastbound or westbound; no free westbound right to Bow Street;
- Continuation of bus/bicycle lane on Prospect Street; and,
- Protected bicycle lanes on Medford Street.

Bicycle and Pedestrian Facilities

The DEIR described existing and proposed bicycle and pedestrian facilities in the study area. Existing bicycle facilities include bicycle lanes and/or sharrows along major roadways, including Beacon Street, Cambridge Street, Medford Street, Webster Avenue, Prospect Street, Washington Street, Bow Street, Church Street, and McGrath Highway. Sidewalks are provided on both sides of most streets in the study area. The City commenced construction of the Somerville Avenue Utility and Streetscape Improvements Project ("Somerville Avenue Improvements Project"), which will provide 12-ft wide sidewalks between Prospect Street and Allen Street, one-way bicycle tracks in each direction and additional bicycle parking spaces. The project also includes:

- A pedestrian plaza providing at-grade, ADA-access to the Union Square Station;
- Continuous 12-ft wide sidewalks on Somerville Avenue, Prospect Street, Washington Street, and Webster Avenue, with street furniture and trees;
- Through-block pedestrian connections, including a path through Block D6 to the Union Square Plaza;
- A pedestrian-only civic space on Newton Street along the D4.3 parcel;
- 1,750 bicycle spaces for short and long-term use across the project site, including at least 550 spaces adjacent to the Union Square station;
- 90 sheltered and secured bicycle spaces adjacent to the station; and,
- At least two bike share stations.

Pedestrian and bicycle conditions were evaluated under Existing 2018, No Build 2025 and Build 2025 conditions. Future conditions were modelled with the City's proposed infrastructure improvements and the mitigation measures listed above.

Pedestrian conditions at each crossing in the study area under the Existing 2018, No Build 2025 and Build 2025 scenarios were evaluated using a Pedestrian Level of Service (PLOS) analysis. The PLOS is a measure of pedestrian delays at crosswalks based on the length of the crosswalk and vehicular traffic flow. The results of a PLOS analysis are expressed as rankings from A to F, where A represents minimal delays and E and F represent long delays that may encourage jaywalking. Crosswalks at eight unsignalized intersections experience PLOS E or F under Existing 2018 conditions across several peak periods. Pedestrian conditions are anticipated to improve between the existing and future conditions due to signalization and other roadway improvements; six unsignalized intersections will have crosswalks operating at PLOS E or F during at least one peak period in the No Build 2025 condition and there will be seven such intersections under Build 2025 conditions.

Based on bicycle counts, the most heavily used roadways in the study area Somerville Avenue, Bow Street, Washington Street, Webster Avenue and Beacon Street. Existing roadway conditions for bicyclists were evaluated using a Level of Traffic Stress (LTS) analysis. The LTS classification is based

on a number of roadway characteristics that affect bicyclists, such as vehicular speed limit and the width of travel, parking and bicycle lanes. The LTS rankings range from 1 to 4; 1 signifies the most favorable conditions and 4 represents the least favorable conditions. Most roadway segments in the planning area were rated with a LTS of 1 or 2. However, sections of streets with the highest bicycle counts, including Inman Square, Beacon Street, Webster Street and Somerville Avenue (west of Union Square) were rated with a LTS of 3. Planned roadway improvements are anticipated to result in better LTS in the 2025 No Build condition on Somerville Avenue, Summer Street, Beacon Street and Webster Avenue. According to the TIA, an increase in bicycle trips could increase overall stress of the cycling network but no streets in the study area are expected to experience stress levels greater than an LTS of 3.

The Proponent will monitor pedestrian and bicycling conditions as part of its Mobility Management Plan. If necessary, intersection improvements may be implemented to reduce pedestrian and bicycle delay and improve safety for these travel modes as pedestrian and bicyclist volumes grow.

Public Transportation

The project site is in proximity to MBTA bus routes providing direct access to Boston, Cambridge and other communities and to the Green, Red and Orange subway lines and Fitchburg Line commuter rail. Bus Routes 85, 86, 87, 91 and CT2 are located within one-quarter mile of the site. In addition, Bus Routes 69, 80, 83, 88 and 90 serve routes that are within a 10-minute walk or one-half mile distance from the project site.

The TIA included an evaluation of transit services within the study area to measure transit service capacity based on the Comfort Metric standards established in the MBTA's 2017 Service Delivery Policy. Passenger comfort is measured as the length of time a passenger spends in crowded conditions on buses. The MBTA has set a target of 96 percent of cumulative route performance to be experienced by passengers in comfortable conditions, with a maximum comfortable passenger-to-seat ratio of 140 percent for high-volume travel periods and 125 percent for low-volume periods.

The TIA modelled individual trips on bus routes and identified individual trips in which the maximum load factors were exceeded at any point along the run. Under Existing 2018 conditions, 14 bus trips will exceed the maximum load factors, including two within the Union Square segment of the bus route. Under 2025 No-Build conditions two additional runs will exceed the maximum load factors compared to Existing 2018 conditions, but no additional trips will exceed the load factors within Union Square.

The Build 2025 condition was established by assigning project-generated transit trips to the Green Line and the 85, 86, 87, 91, and CT2 bus routes based on the origin/destination data used for the project's trip distribution analysis. Trips were assigned to half-hour segments over the course of a typical weekday using existing stop-level usage data for the fifteen bus stops within the study area provided by the MBTA. Boardings and alightings were aggregated by route and direction to provide a distribution of project-generated trips by time, and by boarding or alighting. Project-generated trips were proportionally assigned to each bus run based on the frequency of bus trips on the route. New trips were allocated evenly across runs in each half hour period and added to load counts either arriving (for alightings) or leaving (for boardings) a study bus stop and also leaving upstream (for alightings) and downstream (for boardings) stops. Passengers were assumed to stay on board until the next rapid transit stop, or else the

end of the run. The analysis conservatively measures impacts in Union Square because it maximizes passenger overlap by assuming that that leaving passengers board at the first stop in the study area while arriving passengers disembark at the last stop in the study area. Compared to No Build 2025 conditions, 15 additional trips will exceed the maximum load factors, including 10 within Union Square under Build 2025 conditions. Most of the exceedances will occur on Bus Route 86, which does not currently meet the Comfort Metric target.

The DEIR did not identify any mitigation measures to offset the project's impacts on bus service. As noted by MassDOT, ongoing efforts by the MBTA to improve bus service, including the Better Bus project, changes to the bus network and potential modifications to bus routes once the Green Line opens, are likely to improve bus service in the study area.

Traffic Operations

The TIA provided an evaluation of the impact of project-generated vehicular traffic on roadways in the study area, including an intersection capacity analysis of peak hour traffic operations at study area intersections. The analysis designated intersections with a Level-of-Service (LOS), which reflects the overall operations of an intersection, including traffic speed, delay, and capacity. For urban intersections, LOS D reflects an acceptable level of operations. At least one movement at eleven intersections operates at LOS E or LOS F under Existing 2018 conditions during peak periods. In general, traffic operations at major intersections will experience longer delays and increased congestion under 2025 No Build and 2025 Build conditions. The only intersection that is projected to degrade from LOS D under 2025 No Build conditions to LOS E under Build 2025 conditions is the intersection of Washington Street at McGrath Highway Southbound.

According to the DEIR, planned roadway improvements are designed to promote non-vehicular modes of travel using traffic calming measures and intersection controls to reduce vehicle speeds. MassDOT notes that implementation of these measures will minimize the need to provide mitigation for vehicular operations on roadways. This approach is consistent with MassDOT's goals for the McGrath Boulevard Reconstruction project and the findings of the Lower Mystic Regional Working Group (LMRWG), in which the City participated. The LMRWG recommends that, in general, improvements to transit, bicycle, and pedestrian facilities be implemented as development occurs.

Safety

The TIA reviewed crash data provided by the City for the period from August 2014 to August 2017. Three intersections in the study area, Webster Avenue at Tremont Street and Columbia Street, Beacon Street at Concord Avenue and Beacon Street at Washington Street, exceeded the average crash rate for MassDOT's District 4, which includes Somerville. In addition, there are six Highway Safety Improvement Program (HSIP)-eligible intersections and roadway segments in the study area, including:

- Somerville Avenue between Union Square and McGrath Highway;
- Washington Street between McGrath Highway and Somerville Avenue;
- Prospect Street between Webster Street and Somerville Avenue;
- Webster Avenue between Prospect Street and Somerville Avenue;
- McGrath Highway; and,

- Bow Street.

Roadway improvements previously completed by MassDOT and/or the City have addressed safety concerns at intersections and roadway segments near the project site. According to the DEIR, the traffic monitoring program will be used to determine whether additional mitigation measures may be required to address safety conditions on study area roadways.

Parking

The project will provide 1,495 parking spaces. Most of the spaces will be located in public parking lots on Blocks D.1, D.2, D.3 and D.6. According to the DEIR, the number of spaces was based on the Urban Land Institute's Shared Parking Manual (2nd edition) and ITE's Parking Generation Manual (4th edition). It accounts for land uses in Union Square, the potential for shared uses by time of day and high mode shares for alternative travel modes. According to the DEIR, standard ITE parking rates without shared use would generate a parking supply demand of over 4,800 spaces.

According to the DEIR, parking will be managed by requiring residents and employers to purchase parking separately from any lease or sale of building space within the project ("unbundling"); charging market rates for residential and commercial parking; establishing parking rates on a daily rather than monthly basis; building the parking supply in phases to monitor its use; limiting reserved parking; providing access to car sharing services; reserving desirable spaces for carpool vehicles; and providing real time availability for commercial spaces.

Transportation Demand Management (TDM)

According to the DEIR, the City and Proponent have established a non-vehicular mode share goal of 60 percent for this project. The TIA included a Mobility Management Plan that described TDM measures to be undertaken by the project to reduce vehicle trips to and from the site, including:

- On-site TDM coordinator to oversee all TDM programs for each building;
- Shared vehicle programs, including promoting car-pooling, providing preferential parking for carpools and vanpools, and providing space for a car-sharing service;
- Provision of information on alternate modes of transportation and development of
- transportation-related marketing and education materials;
- Development and maintenance of information pertaining to pedestrian and bicycle
- access to and from the project site;
- Distribution of transit maps and passes;
- Implementation of an emergency ride home program;
- Discounted or free transit passes and Bluebike membership;
- Encouraging employers at the site to offer flexible hours and telecommuting options to employees
- Shuttle service for the hotel;
- Parking management, including requiring employers and residents to purchase parking separate from their lease, market-rate pricing for parking spaces and encouraging daily pricing rather than monthly pricing for parking spaces;
- On-site facilities to promote the use of alternate modes of transportation, including secure

bicycle parking, bicycle repair facilities, showers and changing facilities and implementing a Guaranteed Ride Home program; and,

- Marketing and education programs to encourage alternate modes of travel, including an annual mobility education meeting, posting travel information on the internet and building lobbies, transportation information packets for residents and employees and real-time posting of parking space availability.

Transportation Monitoring Program

The TIA outlined transportation monitoring and reporting that the Proponent will conduct pursuant to the City's requirements, including:

- Annual surveys of residents and employees travel habits;
- Biennial counts of peak auto and bicycle parking occupancy; and,
- Biennial counts of traffic entering and exiting the site.

The survey results and monitoring data will be used to track the success of the project's Mobility Management Plan. If mode share targets are not met, additional TDM measures will be implemented, including increased pricing for parking spaces, on-site amenities to minimize day-time trips from the site by automobile and shuttle service to the Sullivan Square and Central Square MBTA subway stations. According to MassDOT, private shuttles may duplicate existing and future MBTA bus service. The Proponent should consider measures to improve bus service rather than run private shuttles.

Green Line Extension (GLX) Coordination

The Proponent has committed to support the construction and operation of the GLX by providing temporary and permanent easements to the MBTA, interior facilities for MBTA staff, vehicle pickup/drop-off areas, bicycle storage, and an accessible pathway between the station and Prospect Street. These measures are to be completed by the time that the GLX is operational in April 2021. The Proponent has also agreed to coordinate design and construction scheduling of the project with the MBTA. According to MassDOT, the Proponent's obligation to meet that schedule was contingent upon the transfer of the D2 parcel to the Proponent by February 28, 2019. A new schedule is being negotiated. The Proponent will be required to provide the facilities, including ADA-compliant access to the station during the construction of the D2 buildings. If permanent facilities cannot be provided at that time, interim improvements will be necessary. I note that MassDOT and several residents have questioned whether the design of the public plaza along Prospect Street will provide acceptable access to the station.

Air Quality

The DEIR included a mesoscale analysis of the impact of project-generated vehicle emissions on regional air quality and consistency with the National Ambient Air Quality Standards (NAAQS). The analysis was used to determine whether and to what extent the project will increase precursors to the development of ozone, including volatile organic compounds (VOCs) and nitrogen oxides (NO_x). The analysis used the EPA's MOVES mobile-source emissions model vehicle trip data from the transportation analysis to model emissions based on vehicle miles travelled (VMT) and vehicle idling at

intersections for the Existing 2018, No Build 2025 and Build 2025 conditions. A 0.25 percent annual growth rate in vehicle trips was incorporated into the No Build 2025 scenario. The Build 2025 condition includes project-generated trips and assumes the implementation of TDM measures.

The mesoscale analysis evaluated VOC and NO_x emissions within the project study area for each scenario. According to the DEIR, levels of VOC and NO_x will be lower in the 2025 No Build condition than under Existing 2018 conditions because of anticipated improvements in vehicle engine and emission technologies. The project will increase NO_x and VOC emissions compared to the 2025 No Build condition. NO_x emissions will increase from 3.8 tpy to 4.7 tpy and VOC emissions will increase from 6.9 tpy to 8.4 tpy between the 2025 No Build and 2025 Build conditions.

Climate Change

The DEIR provided an analysis of the project's stationary- and mobile-source GHG emissions and identified measures to minimize emissions. It reviewed projected temperature and precipitation conditions and described design features to improve resiliency to the effects of climate change.

Greenhouse Gas (GHG) Emissions

The DEIR included a GHG analysis based on the MEPA GHG Policy. The Policy requires projects to quantify carbon dioxide (CO_2) emissions and identify measures to avoid, minimize or mitigate such emissions. The analysis quantified the direct and indirect CO_2 emissions associated with the project's energy use (stationary sources) and transportation-related emissions (mobile sources). The DEIR outlined and committed to mitigation measures to reduce GHG emissions.

The stationary source GHG analysis evaluated designs of building prototypes that represent proposed buildings of similar size and use. The prototypes that were modelled in the analysis include Large Lab/Office/Retail, Large Office/Retail, Medium Office/Retail, Small Office/Retail, Midrise Hotel/Retail, Midrise Residential/Retail, a Large Residential/Retail prototype reflecting the proposed buildings on Blocks D2.2 and D2.3 and a Large Residential/Retail prototype representing the proposed building on Block D3.2. For each prototype, the analysis evaluated CO_2 emissions for a Baseline Case and the Proposed Case. The Baseline Case was designed to meet the minimum energy requirements of the 9th Edition of the Massachusetts Building Code, which references the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1-2013. The Proposed Case included additional energy-efficiency measures proposed in the Preferred Alternative. The City has adopted the Massachusetts Stretch Energy Code, which requires that new buildings be designed to use 10 percent less energy than required by the baseline Building Code.

The GHG analysis used eQuest modeling software to quantify emissions from the project's stationary sources. The project's overall stationary source CO_2 emissions were estimated at 18,497 tons per year (tpy) under the Baseline Case scenarios for the building prototypes. The measures included in the Proposed Cases will reduce GHG emissions to 15,934 tpy, a reduction of 2,563 tpy (13.9 percent). The estimates of GHG emissions were calculated using the CO_2 emission factor of[2] 117 pounds per MMBtu of gas and 710 pounds per megawatt-hour for grid electricity published by the Independent

[2] Million British Thermal Units.

System Operator- New England (ISO-NE) in the *2016 ISO New England Electric Generator Air Emissions Report.*

The energy efficiency measures modelled in the Proposed Cases include, but are not limited to: window to wall ratios generally consistent with the Building Code; high-efficiency heating, ventilation, and air conditioning (HVAC) systems with variable frequency drives (VFD); heat or energy recovery ventilators; reduced lighting power density (LPD); demand-controlled ventilation; LED exterior lighting; light or reflective roofs; and, Energy STAR appliances and equipment.

The Proponent evaluated the potential for on-site energy generation using rooftop solar photovoltaic (PV) and combined heat and power (CHP) systems. The DEIR indicated that PV systems installed on the D2.1 and D2.3 buildings would generate 292.1 Megawatt-hours (MWh) per year. The DEIR included an evaluation of the use of CHP systems in the Block D2.1 office, hotel and larger residential buildings. The analysis concluded that the use of CHP would reduce energy use and result in significant annual cost savings. The DEIR indicated that the Proponent will consider the use of CHP in these buildings as designs progress.

The Certificate on the EENF required the Proponent to thoroughly evaluate buildings designed to Passivehouse standards. The DEIR cited a study funded by the New York State Energy Research and Development Authority (NYSERDA) that stated that that capital costs of buildings constructed to Passivehouse standards are higher than conventionally-built buildings. The DEIR did not include an analysis of Passivehouse design for any of the buildings nor did it evaluate potential financial incentives that are available to offset costs.

Mobile Source GHG Emissions

The DEIR analyzed the project's mobile-source CO_2 emissions using the EPA's MOVES emissions model and data from the traffic study. The MOVES model calculates emissions factors for vehicles expressed in a volume per distance travelled. Total emissions of vehicles are estimated by applying Vehicle Miles Travelled (VMT) data to vehicles in the study area and emissions from idling vehicles based on intersection delays. Under 2025 Build conditions, which include transportation infrastructure improvements and TDM measures, estimated project-related emissions would be 2,770.2 tpy of CO_2.

Adaptation and Resiliency

The DEIR reviewed how climate change could affect the site and identified potential adaptation and resiliency measures that will be incorporated into the project design. According to the City's Climate Change Vulnerability Assessment (CCVA), the primary vulnerabilities identified for Union Square are flooding due to increased precipitation and exposure to higher temperatures. The average annual temperature in Somerville is expected to increase by 2-3 degrees Fahrenheit (F) by 2030 and by up to 7-8 F by 2070. In addition, the number of extreme heat days with temperatures greater than 90 F will increase to 29-40 by 2030 and up to 90 days by 2070. According to the CCVA, the amount of rainfall associated with the 100-year, 24-hour storm event will increase from 8.9 inches to 10.2 inches in 2030 and 11.7 inches in 2070.

Measures to minimize urban heat island effects include adding tree and vegetative cover in open space areas, using green or cool roofs and using cool pavement types that reflect solar energy and enhance water evaporation. Buildings on Blocks D1, D2 and D3 may be particularly susceptible to flooding because they will be located in low-lying areas. According to the DEIR, the City will address flooding in the area by raising the finished grades of pedestrian facilities and constructing a box culvert that will provide significant storage of stormwater runoff. Emergency backup systems will be incorporated into the design of the buildings to help maintain operations during extreme storm events. The stormwater management systems serving the building sites will include infiltration and detention Best Management Practices (BMPs) and Low Impact Design features such as rain gardens, permeable pavement and green roofs, to infiltrate stormwater and reduce runoff rates.

Hazardous Waste

Every development block at the project site includes areas with contaminated soil that has been or must be addressed to protect public health and the environment. Individual areas or incidences of contaminated soil have been assigned release tracking numbers (RTN) and the analysis and remediation of the releases are subject to MassDEP oversight pursuant to the Massachusetts Contingency Plan (MCP). Contaminants recorded in soil and/or groundwater at the site include polychlorinated biphenyls (PCB), metals (including arsenic and lead), petroleum hydrocarbons, polyaromatic hydrocarbons (PAH), non-aqueous phase liquid (NAPL), light non-aqueous phase liquid (LNAPL), volatile organic compounds (VOC), semivolatile organic compounds (SVOC) and chlorinated volatile organic compounds (CVOC).

The DEIR provided a detailed review of known releases of hazardous waste at the site. It provided maps showing all areas that have been assigned an RTN and are subject to Activity and Use Limitations (AUL). The AULs applicable to areas in the project site generally prohibit residential, daycare, school, agricultural, community center or public park uses. For each development block, the DEIR provided: a history of site uses; identified releases of hazardous materials; summarized reporting and remedial actions undertaken in accordance with the MCP; noted the status of each RTN in the MCP process; and, identified additional assessment, remediation and/or other measures that will be necessary to achieve or maintain a level of No Significant Risk. It described construction-period measures, including dust control, soils and groundwater management and disposal, and monitoring of contaminant levels in exposed soils. Construction activities on sites that have not achieved MCP closure or are subject to an AUL will comply with the requirements of Release Abatement Measure (RAM) plans developed in accordance with the MCP and submitted to MassDEP.

Releases on Blocks D1, D4 and D7 have been remediated and have achieved regulatory closure under the MCP. A portion of Block D1 is subject to an AUL. According to the DEIR, the civic use planned for Block D1 will be designed to prevent exposure to contaminated soil and the existing AUL will be terminated, modified or replaced to allow for public access to the area. Two RTNs are located on Block D5, one of which has been closed and the other of which involves the presence of VOC. Four releases are located on Block D6, including three closed RTNs and one open RTN involving NAPL in groundwater that will require remediation. A portion of Block D6 is subject to an AUL. Eleven of 12 RTNs at Block D3 have been closed; the remaining open RTN involves releases of lead and arsenic that may require additional remedial activities. One of the closed RTNs pertaining to 56 Webster Avenue involved elevated levels of PCB that were remediated in accordance with the MCP and the federal Toxic

Substances Control Act (TSCA). The property is subject to two AULs which limit uses and require that soils with elevated PCB levels be covered by buildings. Two other AULs prohibit uses on other parts of Block D3.

Twenty RTNs have been assigned to releases on Block D2, of which five have been closed. Twelve of those are not in compliance with the MCP due to lack of progress in meeting MCP requirements. Two RTNs have been assigned to the former Kiley Barrel Disposal site (RTN 3-02849 and RTN3-185139), which includes approximately 25 percent of Block D2. The site was contaminated by PCB, VOC, SVOC and metals and has been remediated pursuant to the TSCA and the MCP. The remediation included the removal of the top three feet of soil and any soils below three feet with elevated levels of PCB and CVOC; installation of a three-foot thick surface cap; and remediation of VOC in groundwater. An AUL may be placed on the site. Two RTNs have been assigned to off-site parcels affected by the releases on the Kiley Barrel site.

Twelve RTNs have been assigned to areas of Block D2 outside of the Kiley Barrel site referencing releases of VOC, PCB, metals, petroleum hydrocarbons and/or PAH. The 12 RTNs are not in compliance with the MCP. According to the DEIR, the Proponent will prepare the necessary documentation to bring the 12 RTNs into compliance with the MCP within 120 days of purchasing Block D2. Additional assessments of soil and groundwater conditions will be conducted and it is expected that additional remediation activities will be required, including excavation of contaminated soil, capping and designation of AULs.

Stormwater Management

The DEIR reviewed the existing and proposed drainage infrastructure in Union Square. Stormwater is conveyed by combined sewers or by separate storm drains and sanitary sewers that eventually connect to the City's combined sewer system. Stormwater runoff is ultimately conveyed, along with sanitary flows, through the City's combined sewer system to MWRA's Deer Island Wastewater Treatment Plant (DITP). In large storms, the volume of stormwater entering combined sewers from Cambridge, Somerville and Charlestown can exceed the capacities of the Cambridge Branch Sewer and DeLauri Pumping Station and contribute to combined sewer overflow (CSO) discharges to the Mystic and Charles rivers. The Somerville Avenue Improvement Project will separate stormwater from the combined sewer system carrying both stormwater and wastewater flows. Stormwater will be directed into a 14-foot by 6-foot box culvert that will increase capacity in both drainage and sanitary sewer systems and reduce surcharging events that cause flooding in Union Square. The culvert will convey stormwater to the MBTA's GLX drainage system via a new pump station. Runoff from Parcels D1, D2 and D6 will be directed to the Somerville Avenue drainage system. Combined sewer systems are also located in Columbia Street and Webster Avenue. Lots D3.2 and D3.3 will drain into the combined sewer in Columbia Street, which the City intends to separate in the future, and Lot D3.1 will drain into the Webster Avenue combined sewer. According to the EENF, adequate capacity will exist to handle flows from these parcels.

The DEIR did not provide a detailed description of the proposed stormwater management systems for each development block. It included a commitment to meet the SMS by mitigating peak rates of runoff and improving water quality. The stormwater management systems will include detention and infiltration facilities and LID measures. Best Management Practices, including proprietary

water quality units and detention and infiltration systems, will be used to reduce Total Suspended Solids in stormwater and to remove phosphorous consistent with the Total Maximum Daily Load (TMDL) limits for the Charles River.

Water and Sewer

The DEIR reviewed the existing and proposed wastewater and water infrastructure in Union Square. The project's peak wastewater flow, representing 200 percent of the average daily flow, will be 280,970 gpd and the annual flow will be 140,585 gpd. According to the DEIR, the municipal sewer system has adequate capacity to convey project-generated flows. The project will be required to offset its impacts to the sewer system by providing Inflow and Infiltration (I/I) mitigation to remove four gallons of I/I for every gallon of new wastewater generated. The Proponent will provide the City with a payment of $3.5 million to offset its sanitary flows.

The project will use 141,000 gpd of water. According to the DEIR, existing or planned components of the City's water distribution system in Union Square have sufficient capacity to provide water to the project. The project will conserve water by using efficient plumbing fixtures and by harvesting rainwater for irrigation, cooling water tower make-up water, and/or toilet flushing.

Historical Resources

Nineteen buildings in the project site are listed in the Inventory, of which seven have been demolished. The DEIR provided an analysis of visual and shadow impacts of proposed buildings on historic properties within and adjacent to the project site. Comments from MHC indicate that the project will have no adverse effect on historic or cultural resources.

Public Benefit Determination

Blocks D2 and D3 include landlocked tidelands. Therefore the project is subject to the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168) and the Public Benefit Determination regulations (301 CMR 13.00). Consistent with Section 8 of the legislation, a Public Benefits Review must be conducted as part of the EIR review of projects located on landlocked tidelands that entail new use or modification of an existing use. I will issue a Public Benefits Determination (PBD) within 30 days of the issuance of a Certificate on the Final EIR.

According to the DEIR, the D2 and D3 blocks are located more than one mile away from both the Charles and Millers Rivers and will not have any impact on the public's right to access jurisdictional tidelands regulated by MassDEP under Chapter 91. The project is proposed to fulfill the City's goals for Union Square as developed through public planning processes and it will enhance the project site by remediating contaminated soil and providing access to Union Square Station. The DEIR identified the following public benefits of the project:

- Open space and indoor space open to the public;
- Bicycle and pedestrian facilities within the project site and along its perimeter, with connections to adjacent neighborhoods;
- Stormwater management systems on each parcel;

- Ground-floor retail uses to attract the public to Union Square; and,
- Economic opportunities for area residents.

Construction

The DEIR identified measures to prevent or minimize impacts during the construction period. The project will develop a construction plan with detailed construction-period mitigation measures that will be implemented by the contractor. It will identify truck routes, provide access and staging plans, and describe measures to protect public safety through the use covered walkways, signage and police details. A Stormwater Pollution Prevention Plan (SWPPP) will be developed to specify sedimentation and erosion controls to manage stormwater runoff, including protecting catch basins with filter fabric, hay bales and/or silt fences around stockpiled soils, and temporary sedimentation basins. The project will also include measures to minimize and mitigate the project's dust, noise and vibration impacts.

Conclusion

Based on a review of the DEIR, comments letters and consultation with State Agencies, I have determined that the DEIR adequately and properly complies with MEPA and its implementing regulations. The MEPA regulations indicate that a DEIR can be determined adequate, even if certain aspects of the Project or issues require additional description or analysis in a FEIR, provided that it is generally responsive to 301 CMR 11.07 and the Scope.

As identified in the Scope, the Proponent must provide more detailed information, about the project design to support public review and comment. I note that the DEIR did not respond to the Scope requirement for an analysis of Passivehouse building design; this analysis must be provided in the FEIR. The FEIR must provide a clear commitment to mitigating the project's impacts and provide detailed draft Section 61 Findings which identify schedules, cost estimates and responsible parties for each measure consistent with the requirements of the MEPA regulations. As noted below, the FEIR must clarify the process for identifying additional mitigation measures that may be necessary as a result of monitoring and identifying responsible parties. In addition to providing responses to comments on the DEIR, the FEIR must include a revised response to comments received on the EENF that provides direct responses to all comments. I am confident that the Proponent can address these issues in the FEIR; however a Supplemental FEIR can be required if the FEIR is not responsive.

SCOPE

The FEIR should be prepared in accordance with the Scope below. I encourage the Proponent to continue dialogue with the City, State Agencies and interested parties prior to and throughout the preparation of the FEIR.

General

The FEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope. The FEIR should include a comprehensive analysis of the project that demonstrates that the Preferred Alternative includes all feasible means to avoid Damage to the Environment, or to the extent that Damage to the Environment cannot be avoided, that it includes

measures to minimize and mitigate Damage to the Environment to the maximum extent practicable. I note that a Supplemental FEIR will be required if the FEIR is not sufficiently responsive to this Scope.

The project will be built out in multiple phases over an approximately 20-year period. The transportation analysis in the DEIR, in particular, assumes that a number of public infrastructure projects will be completed and function as intended within the project's build-out schedule. The Proponent has committed to monitor transportation impacts and may be required to provide additional mitigation measures in accordance with the City's permits if transportation targets are not met. Phasing of the project can have a significant impact on the ability of the project to avoid, minimize and mitigate environmental impacts over time. Changes in transportation, technology, and climate will shape the development, environmental impacts and inform development of mitigation. Monitoring of impacts and effectiveness of mitigation to inform subsequent phases will be necessary, in particular, in regards to transportation, climate adaptation and resiliency, energy use and public benefits.

The FEIR should include a more robust discussion of the project's phased build-out. The phasing MEPA.1
plan must identify building program, infrastructure, environmental impacts, and mitigation and public benefits for each phase. The phasing plan must be provided in the narrative and in tabular format and should be supported with site plans at an appropriate scale. It will be particularly important to demonstrate that access to the Union Square Station will not be impeded at intermediate stages of development, and that transportation/transit mitigation, GHG commitments, stormwater improvements, public open space, and other public benefits are phased proportionally to development. As noted below, the FEIR should address appropriate thresholds for provision of phased mitigation. Due to the long-term MEPA.2
nature of the project's build-out, the FEIR should outline an approach to assess the effectiveness and relevancy of mitigation commitments to changing conditions, updated data, and improvements in technology. This approach should also include a process for public review and reconsideration of mitigation commitments as necessary and identify any process required by the City for this purpose.

Project Description and Permitting

The FEIR should describe the project, identify any changes to the project since the filing of the MEPA.3
DEIR and identify associated environmental impacts. It should provide an update on the acquisition of MEPA.4
parcels by the City and/or Proponent. Most of the development blocks are not owned by the Proponent and detailed information on existing proposed conditions has not been provided. The FEIR should MEPA.5
provide conceptual plans at a legible scale depicting access roads and internal driveways, transit connections, pedestrian and bicycle accommodations, parking areas, open space and stormwater, wastewater, and water supply infrastructure. The first phase of the project on Block D2 is at a more MEPA.6
advanced design level. The FEIR must include significantly greater detail, including plans at an appropriate scale, than has been provided in the EENF and DEIR. The FEIR should identify the total MEPA.7
build-out associated with the building program and build-out associated with each phase. It should clarify whether construction of the roadway network and other infrastructure will be phased with the MEPA.8
structures or constructed across the site prior to build-out of each phase. The FEIR should include site plans, if necessary for existing and post-development conditions clearly identifying access roads and MEPA.9
internal driveways, transit connections, pedestrian and bicycle accommodations, parking areas, and stormwater, wastewater, and water supply infrastructure. The FEIR should provide a detailed description MEPA.10
of all open space areas, a quantification of the area of each open space that will be provided with each phase and proposed structures, use and programming.

The FEIR should identify and describe State, federal and local permitting and review requirements associated with the project and for each phase, including Land Transfers. It should include a description and analysis of applicable statutory and regulatory standards and requirements, and a discussion of the project's consistency with those standards. It should provide an update on the status of permitting and review, an overview of on-going opportunities for public review and comment on the project and a description of how more detailed information about existing and proposed conditions, including soil contamination, will become available to the public as the Proponent acquires additional properties. The Proponent should consult with the MBTA regarding the need to complete a standard canvassing process in connection with MassDOT's permitting on former railroad ROW pursuant to Chapter 40, Section 54A. MEPA.11 MEPA.12 MEPA.13

The FEIR should include a summary table and narrative identifying the potential environmental impacts associated with the Preferred Alternative and any off-site infrastructure or improvements. The table should identify cumulative impacts and impacts associated with each phase. MEPA.14

Traffic and Transportation

The project is designed to take advantage of existing and public infrastructure investments by the City and State, including the GLX, potential improvements to bus service, streetscape and roadway improvements and new or expanded water and sewer infrastructure. The Proponent will provide access and indoor space to support the GLX, has or will contribute financially to public infrastructure projects and will provide on-site pedestrian and bicycle facilities to encourage these modes of travel. Several commenters raised questions about the methodology used for the PLOS analysis. The FEIR should include an explanation of the methodology used in the analysis, including how pedestrian delays were estimated and assumptions regarding pedestrian walk times. MEPA.15

The transportation analysis in the DEIR assumes that a number of public transportation projects will be completed and function as intended within the project's build-out schedule. The Proponent has committed to monitor transportation impacts and may be required to provide additional mitigation measures in accordance with the City's permits if transportation targets are not met. The DEIR identified future programs, such as the MBTA's commitments to improve bus service, which may add capacity and/or improve service if completed. However, the DEIR did not include an analysis of specific potential transit service improvements that could be implemented if necessary to minimize the project's impacts

The FEIR should identify specific metrics that will be evaluated during the phased build-out of the project to determine the need for additional transportation mitigation measures. It should include a contingency plan for identifying and implementing additional transit, bicycle and pedestrian mitigation measures that could be implemented by the Proponent, the City and/or the MBTA. These measures may include changes to specific bus routes, additional busses or trains, bus lanes or prioritization, intersection improvements, traffic signal phasing adjustments and TDM measures. The FEIR should address the need for and appropriateness of mitigation measures to correct safety-related deficiencies. The Proponent should develop this information in consultation with MassDOT and the City. MEPA.16 MEPA.17 MEPA.18

The FEIR should include an expanded and more detailed traffic monitoring plan that will provide the necessary data for on-going analysis of transportation conditions and decisions regarding the need for additional mitigation measures. The monitoring plan should include: MEPA.19

- Simultaneous automatic traffic recorder (ATR) counts at each site driveway for a continuous 24-hour period on a typical weekday;
- Travel survey of employees and patrons at the site;
- Updates on the TDM plan implementation;
- Bicycle usage data;
- Weekday AM and PM turning movement counts (TMCs) and operations analysis at key intersections within the study area;
- Crash data and analysis for the HSIP locations in the study area;
- Pedestrian counts at the HSIP locations, and
- Transit (bus and train) ridership counts.

I refer the Proponent to comments from MassDOT regarding the coordination of the project with the GLX. The FEIR should include a section that provides detailed information, including plans, which reflect the project's coordination with the GLX. The section should address MassDOT concerns and include responses to MassDOT comments. It should provide detailed plans of proposed vehicular, pedestrian and bicycle access to Union Square Station, including any access to be provided from the Prospect Street Bridge. The FEIR should include a discussion of the feasibility of providing an elevator to the station and review potential locations and designs. Many commenters, including MassDOT, requested additional details about the civic space proposed along Prospect Street and how it will provide access to the station. The FEIR should provide detailed plans of the open space, including proposed grades, surface treatments, and pedestrian and bicycle facilities. The FEIR should clearly demonstrate that the project will provide ADA-compliant access to the station. It should identify the location and design of all amenities the Proponent is required to provide in connection with the MBTA station. MEPA.20 MEPA.21 MEPA.22

The DEIR provided a summary of the shared parking demand model used to calculate the peak parking demand. The FEIR should provide more detail about the model and its assumptions, as requested by MAPC. The FEIR should address how shared parking will be provided and managed during the phased build-out of the project. MEPA.23 MEPA.24

Greenhouse Gas Emissions

The DEIR did not provide an analysis of the feasibility of Passivehouse design for any of the proposed buildings, as requested in the Scope. Passivehouse design offers cross-cutting benefits, including minimizing GHG emissions, lower utility costs, comfort and noise attenuation. These benefits can significantly reduce energy costs and improve the quality of housing and office space within a dense, urban area in close proximity to traffic and trains. The FEIR should analyze the energy savings and reductions in GHG emissions that would be achieved by constructing buildings in accordance with Passivehouse design standards. It should identify financial incentives available for Passivehouse design construction, incorporate incentives into cost estimates and analyze the feasibility of constructing the proposed buildings to those standards. The Passivehouse cost evaluation should reflect the economies of scale that can be achieved by the project. MEPA.25 MEPA.26

Comments from DOER emphasize the significant opportunity to reduce GHG emissions by prioritizing an aggressive electrification approach. This approach would maximize the number of end uses that are served with electricity to take advantage of the projected long-term declining emission rates of the Commonwealth's electrical grid. DOER's comment letter identifies a pathway to achieve reductions in GHG emissions of up to 71 percent compared to buildings constructed to meet the Building Code. As noted by DOER, the DEIR described the use of VRF heat pumps which could play a critical role in realizing the long-term benefits of electrification.

The City has adopted a goal of becoming carbon neutral by 2050. DOER's comment letter identifies opportunities for the project to make a meaningful contribution towards that goal. The FEIR MEPA.27
should address the project's consistency with that goal. It should include commitments to build one or MEPA.28
more multi-family buildings to Passivehouse standards and/or incorporate electric heat and hot water into the project design. The FEIR should include an evaluation of additional scenarios associated with MEPA.29
an aggressive electrification approach based on projected long-term declining emission rates of the Commonwealth's electrical grid.

Stormwater

According to the DEIR, construction of a new box culvert as part of the Somerville Avenue Improvement Project is expected to reduce flooding in Union Square. The culvert will convey stormwater to the MBTA system via a new pump station. The City will be not be permitted to convey stormwater flows to the.MBTA's system if flood levels rise to six inches below the top of the MBTA's commuter rail tracks. The DEIR did not address how stormwater will be managed when flows cannot be directed into the MBTA's system or how the site would be affected under such circumstances. The MEPA.30
Proponent should consult with the City regarding the expected frequency of flood events of this magnitude and how the City intends to address the limitation. This information should be provided in the FEIR, including any on-site resiliency or stormwater management measures that may be necessary.

Mitigation and Section 61 Findings

The FEIR should include a separate chapter that summarizes measures to avoid, minimize and mitigate environmental impacts and to provide public benefits. For each phase, the FEIR should include MEPA.31
draft Section 61 Findings for the SRA and any other Agency that will take Agency Action. The proposed Section 61 Findings should specify in detail all feasible measures that the Proponent will take to avoid, minimize and mitigate potential environmental impacts to the maximum extent practicable. The draft Section 61 Findings should clearly identify parties responsible for funding and implementation, and the anticipated implementation schedule that will ensure mitigation is implemented when appropriate in relation to environmental impacts. The FEIR should include a commitment to MEPA.32
provide a self-certification to the MEPA Office at the completion of each phase of the project. It should be signed by an appropriate professional (e.g. engineer, architect, transportation planner, general contractor) indicating that all of the GHG mitigation measures, or equivalent measures that are designed to collectively achieve identified reductions in stationary source GHG emission and transportation-related measures, have been incorporated into the project.

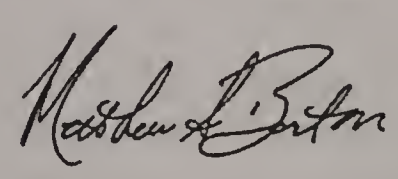
Responses to Comments

The FEIR should contain a copy of this Certificate and a copy of each comment letter received. MEPA.33 In order to ensure that the issues raised by commenters are addressed, the FEIR should include direct responses to comments, to the extent that they are within MEPA jurisdiction. The responses should not refer to a chapter or section of the FEIR. As noted above, the Proponent is being afforded another opportunity to provide direct responses to comments on the EENF. The level of responsiveness will be evaluated in determining whether a Supplemental FEIR is warranted. This directive is not intended, and shall not be construed, to enlarge the scope of the FEIR beyond what has been expressly identified in this Certificate.

Circulation

The Proponent should circulate the FEIR to those parties who commented on the EENF and/or DEIR, any Agency from which the Proponent will seek a "Permit" as defined in 301 CMR 11.00, and any other Person or Agency identified in the Scope or thereafter, or otherwise specified in 301 CMR 11.16(3).

Several commenters submitted comments electronically without providing a mailing address. The Proponent should distribute the FEIR to these commenters via email. A copy of the FEIR should be made available for public review at the Somerville Public Library.



March 8, 2019
Date

Matthew A. Beaton

Comments received:

02/12/2019	Joshua Van Dyke
02/13/2019	Andrew Lalli
02/14/2019	Somerville Catholic Collaborative
02/20/2019	Josh Carel
02/21/2019	Jimi and Tolu Becks Oke
02/22/2019	Peter Brown
02/22/2019	Jack Connolly
02/22/2019	Jim Harvey
02/22/2019	Cheryl Horan
02/25/2019	Metropolitan Area Planning Council (MAPC)
02/25/2019	Paola Massoli
02/25/2019	Somerville Catholic Collaborative
02/26/2019	Thomas Bent
02/26/2019	Stuart Landucci

02/26/2019	Andrew Wade
02/26/2019	Rachel J. Weil
02/26/2019	Kevin J. Gatlin
02/27/2019	Bill Cavellini
02/27/2019	Robert McWatters
02/27/2019	Sandra L. McGoldrick
02/27/2019	Don Hughes
02/28/2019	Zac Zasloff
02/28/2019	Stephen H. Kaiser
02/28/2019	Lawrence P. Venezia
02/28/2019	Charles Gray
03/01/2019	Richard M. Brenner
03/01/2019	Massachusetts Department of Transportation (MassDOT)
03/01/2019	Johnathan Andrews
03/01/2019	Somerville Bicycle
03/01/2019	City of Somerville
03/01/2019	Massachusetts Department of Environmental Protection – Northeast Regional Office (NERO)
03/01/2019	Brett Levy
03/01/2019	Massachusetts Historical Commission (MHC)
03/01/2019	Massachusetts Water Resources Authority (MWRA)
03/01/2019	Somerville Catholic Collaborative
03/01/2019	Stephen V. Mackey
03/01/2019	Scott Hayman
03/01/2019	Somerville YIMBY
03/01/2019	Pennie Taylor
03/01/2019	Julia Travaglini
03/01/2019	Union United Coalition
03/01/2019	Union Square Neighborhood Council
03/04/2019	Wig Zamore
03/05/2019	Department of Energy Resources (DOER)

MAB/AJS/ajs

6.2 MEPA Certificate

MEPA.1 **The FEIR should include a more robust discussion of the project's phased build-out. The phasing plan must identify building program, infrastructure, environmental impacts, and mitigation and public benefits for each phase. The phasing plan must be provided in the narrative and in tabular format and should be supported with site plans at an appropriate scale. It will be particularly important to demonstrate that access to the Union Square Station will not be impeded at intermediate stages of development, and that transportation/transit mitigation, GHG commitments, stormwater improvements, public open space, and other public benefits are phased proportionally to development.**

Section 1.2.3.1 includes a more robust discussion of the Project's phased build-out in narrative and in tabular format (Table 1-2 and Appendix B) and also includes site plans that depict Project phasing. Section 1.4 includes additional details regarding the City's Union Square infrastructure and streetscape improvement program. Access to Union Square Station will be provided through a combination of Project and MBTA improvements that will be constructed during the first phase of development. Future phases of development will not impede access to Union Square Station. Table 1-2 depicts how Project mitigation and benefits will be delivered proportionally to development. In addition, mitigation commitments are provided by phase in Chapter 5.

MEPA.2 **The FEIR should address appropriate thresholds for provision of phased mitigation. Due to the long-term nature of the project's build-out, the FEIR should outline an approach to assess the effectiveness and relevancy of mitigation commitments to changing conditions, updated data, and improvements in technology. This approach should also include a process for public review and reconsideration of mitigation commitments as necessary and identify any process required by the City for this purpose.**

The FEIR addresses each of these matters. Section 2.5 includes a discussion of metrics that may be used to identify transportation mitigation measures, and potential measures that could be implemented. As further discussed in Section 2.5, US2 may conduct a variety of multimodal traffic counts and analysis at a proportional scale to the level of development realized in a given period per the conditions of its CDSP and other permitting agreements and conditions with the City. This data may help inform the City's on-going analysis of transportation conditions and decisions regarding the need for additional mitigation measures. Under City zoning requirements and the terms of the CDSP, US2 must apply for and obtain DSPR approval for each building or phase of construction of the Project, and as part of the DSPR process there is an extensive public review and comment process that includes not only a public hearing before the Somerville Planning Board, but also neighborhood meetings at which impacts of the Project and of what is proposed in the applicable DSPR application will be considered.

MEPA.3 **The FEIR should describe the project, identify any changes to the project since the filing of the DEIR and identify associated environmental impacts.**

The FEIR includes a description of the Project, identifies changes to the Project since the filing of the DEIR, and identifies associated environmental impacts. Section 1.2.3 includes a Project description. As noted in the FEIR, including in Section 1.2.1, the Project changed and improved in a variety of ways since the DEIR. These changes, which have been made in response to public and community comments (including from the Union Square Neighborhood Council), the MEPA process, input from the GLX project team and other agencies, and discussions with the City, including its planning staff have served to improve the Project and further mitigate environmental impacts that were identified in the DEIR.

MEPA.4 **Provide an update on the acquisition of parcels by the City and/or Proponent.**

US2 and the SRA are parties to that certain Master Land Disposition Agreement dated May 2, 2017 (as amended and assigned, the "MLDA") by and between the SRA and Union Square Station Associates LLC, as the same has been assigned from Union Square Station Associates LLC to US2 pursuant to that certain Assignment and Assumption of Amended and Restated Master Developer Designation Agreement, Master Land Disposition Agreement, Development Covenant and CDSP, dated March 16, 2018. Pursuant to the MLDA, US2 has been working with the SRA to satisfy the conditions to the conveyance from the SRA to US2 of D2. The SRA has in turn been working with the City of Somerville to cause the City to convey to the SRA the remaining outstanding portion of D2 that is not yet owned by the SRA, which parcel remains in City ownership. Following the SRA's acquisition of this remaining parcel and the satisfaction of certain other conditions precedent in the MLDA, US2 will acquire all parcels comprising D2. The closing of this acquisition is currently anticipated to occur concurrent with the commencement of construction on D2.

US2 has not acquired any parcels since the filing of the DEIR.

MEPA.5 **The FEIR should provide conceptual plans at a legible scale depicting access roads and internal driveways, transit connections, pedestrian and bicycle accommodations, parking areas, open space and stormwater, wastewater, and water supply infrastructure.**

Conceptual plans which depict access roads and internal driveways, transit connections, pedestrian and bicycle accommodations, parking areas, open space and stormwater, wastewater, and water supply infrastructure are provided in Section 1.2 and Appendix A1 of the FEIR. Bus stop locations are shown in Figure 2-1.

MEPA.6 **The first phase of the project on Block D2 is at a more advanced design level. The FEIR must include significantly greater detail, including plans at an appropriate scale, than has been provided in the EENF and DEIR.**

The FEIR includes significantly greater detail regarding the first phase of the Project, including detailed plans at an appropriate scale, than was previously providing in the EENF and DEIR. Sections 1.2.3 and 1.2.4 provide additional details regarding the proposed design of D2. Section 1.2.3.1 provides an overview of the first phase, Section 1.2.4.4 includes a discussion of the D2 civic open space and Section 1.3 describes the ongoing coordination with the MBTA, GLX project team, and the City related to Union Square Station. In addition, the following plans have been included in order to provide additional details regarding the D2 design:

- Figure 1-8: D2 Site Plan;
- Figure 1-9: D2 Site Circulation;
- Figure 1-10: D2 Civic Space Features;
- Figure 4-1: D2 Stormwater Management; and
- Appendix A2: D2.1 and D2.2-2.3 Building Elevations.

MEPA.7 **The FEIR should identify the total build-out associated with the building program and build-out associated with each phase.**

The FEIR identifies and provides details regarding the total build-out associated with the building program and build-out associated with each phase. Specifically, Section 1.2.3, Table 1-2 and Appendix B, as well as Figures 1-4 to 1-7 depict the total build-out associated with the building program, including program mix, and the build-out associated with each phase.

MEPA.8 **Clarify whether construction of the roadway network and other infrastructure will be phased with the structures or constructed across the site prior to build-out of each phase.**

The on-site thoroughfares and infrastructure for the Project Blocks will be phased with the construction of the structures on individual Lots. On some of the Blocks (D1, D2 and D3), US2 will be constructing internal thoroughfares that will improve neighborhood permeability and circulation or provide clearly defined service routes. The construction of the Project's thoroughfares as well as the infrastructure related to each Lot will be constructed concurrent with the development of each Lot and Block, as described in detail in Section 1.2.3.1 and shown on Figures 1-4 to 1-7. As each individual building is constructed, it will access and connect to the existing public roadway and infrastructure

network, as improved through the City's infrastructure program. Additional information regarding Project and the City infrastructure phasing is provided in Sections 1.2.3.1 and 1.2.4.

MEPA.9 **The FEIR should include site plans, if necessary, for existing and post-development conditions clearly identifying access roads and internal driveways, transit connections, pedestrian and bicycle accommodations, parking areas, and stormwater, wastewater, and water supply infrastructure.**

Site plans depicting existing and post-development conditions including access roads and internal driveways, transit connections, pedestrian and bicycle accommodations, parking areas, open space and stormwater, wastewater, and water supply infrastructure are provided in Section 1.2 and Appendix A1.

MEPA.10 **The FEIR should provide a detailed description of all open space areas, a quantification of the area of each open space that will be provided with each phase and proposed structures, use and programming.**

The FEIR provides detailed descriptions of open space areas, quantifies the area of each open space that will be provided with each phase, as well as proposed structures, use and programming. Specifically, Section 1.2.4.4 provides a detailed description of the network of 11 new open space areas that will be created with the Project, as well as anticipated uses and programming. Section 1.2.3.1 and Table 1-2 quantify the amount of open space to be constructed during each phase and in total for the Project. The proposed structures, use and programming of each open space will be determined as part of the City's DSPR process. As part of that process, each civic open space will be designated a type (e.g., park, plaza, community garden, etc.) that accommodates different community needs. Design standards, by type, guide open space dimensions, the amount of seating and tables, the priority for permeable surface, and the quantity of tree planting and other planted surfaces. The design of each civic open space will be shaped by the DSPR process that includes opportunities for public comment (i.e., two neighborhood meetings and a public hearing) as well as appearances before the Somerville Design Review Committee and the Somerville Planning Board.

As discussed in Section 1.2.1, since the filing of the DEIR, US2 has proposed to increase the amount of open space to be included in the first phase of the Project, in excess of what is required under zoning and the CDSP. These changes were made in response to public and community comments (including from the Union Square Neighborhood Council), the MEPA process and input from the GLX project team and other agencies, and discussions with the City, including its planning staff and Planning Board.

MEPA.11 **The FEIR should identify and describe State, federal and local permitting and review requirements associated with the project and for each phase, including Land Transfers. It should include a description and analysis of applicable statutory and regulatory standards and requirements, and a discussion of the project's consistency with those standards.**

An updated summary of anticipated state, federal and local permits and approvals is included in the FEIR, including Land Transfers, and discusses the Project's compliance with applicable requirements. Section 1.5 identifies and describes the anticipated state, federal and local permitting and review requirements for each phase, including Land Transfers, which are listed in Table 1-4 and individually discussed in Sections 1.5.1 to 1.5.3 and Section 1.6.

MEPA.12 **It should provide an update on the status of permitting and review, an overview of on-going opportunities for public review and comment on the project and a description of how more detailed information about existing and proposed conditions, including soil contamination, will become available to the public as the Proponent acquires additional properties.**

The FEIR includes updated information on the status of permitting and review. Section 1.6 describes the status of the Project permitting and review process, including, as established by the Union Square Zoning, the process through which US2 will be required as part of each building or phase's DSPR submissions, to participate in pre-submittal meetings, multiple rounds of neighborhood meetings, design review meetings, and Planning Board hearings for each building, civic open space and roadway area to be constructed as part of the Project. As noted, these procedures are designed to ensure public input is received at each step in the application process, but most importantly, it achieves this feedback early in the design process at a time when it can more efficiently effect change. Section 1.6 also includes an overview of public comment opportunities to date, as well as opportunities for future public comment as each Lot completes the DSPR process. The section further outlines the status of current permitting and describes how additional information regarding Lot soil conditions will be provided as part of DSPR.

As outlined in Section 1.6, prior to starting the DSPR process for each individual project, US2 is required to demonstrate land control of the property related to that project component and do additional diligence related to existing conditions, including soil contamination, if any. The DSPR process will also require provision of additional information including a survey of existing conditions and proposed conditions, plans that outline the proposed development and a copy of soil contamination reports, if any, prepared for the property. If any soil contamination reports identify conditions that require clean-up in order to implement the proposed development, US2 will pursue any required environmental approvals through the appropriate regulatory processes. US2 will make additional public disclosures related to soil contamination as required by the regulatory process.

Section 1.5 identifies and describes the anticipated state, federal and local permitting and review requirements for each phase, including Land Transfers, which are listed in Tables 1-4 to 1-7 and further and individually discussed in Sections 1.5.1 to 1.5.3 and Section 1.6.

MEPA.13 **The Proponent should consult with the MBTA regarding the need to complete a standard canvassing process in connection with MassDOT's permitting on former railroad ROW pursuant to Chapter 40, Section 54A.**

US2 has been in regular contact with the MBTA and MassDOT and their counsel, including in connection with discussions over design and construction coordination and the need for the completion of the Chapter 40, Section 54A process. Because the Project includes proposed construction of structures on lands formerly used as a railroad right-of-way, US2 will need to cause the submission to MassDOT of a Chapter 40 Section 54A application, which application will need to be addressed to MassDOT from the building inspector of the City of Somerville. Once the completed application has been submitted to MassDOT, MassDOT will undertake a review of the application, including a standard canvassing process through which review of the application by other interested public agencies will be solicited by the applicable persons within MassDOT. After completion of this standard canvassing process, MassDOT and any other applicable interested public agency will review the application and MassDOT will contact the applicant to schedule and advertise a public hearing respecting the Chapter 40 Section 54A application. Upon completion of the public hearing and of MassDOT's review of public comments resulting from the public hearing, if any, MassDOT will typically send a letter to the applicant issuing the Secretary's decision to the building inspector and the applicant. US2 will consult with MassDOT regarding the process to acquire the approval under Chapter 40, Section 54A, as presented in Section 1.5.2.2. Figure 3-1 of the DEIR identified those properties potentially subject to MGL Chapter 40, Section 54A.

MEPA.14 **The FEIR should include a summary table and narrative identifying the potential environmental impacts associated with the Preferred Alternative and any off-site infrastructure or improvements. The table should identify cumulative impacts and impacts associated with each phase.**

The FEIR includes information regarding these matters. Table 1-2 and Section 1.2.3.1 include a summary table and narrative describing the Preferred Alternative by phase and its impacts and benefits, as well as cumulative impacts and benefits.

MEPA.15 **The FEIR should include an explanation of the methodology used in the PLOS analysis, including how pedestrian delays were estimated and assumptions regarding pedestrian walk times.**

Section 2.1 includes an explanation of the methodology used in the PLOS analysis, including how pedestrian delays were estimated and assumptions regarding pedestrian walk times.

MEPA.16 **The FEIR should identify specific metrics that will be evaluated during the phased build-out of the project to determine the need for additional transportation mitigation measures.**

Section 2.5 includes information regarding specific metrics that would indicate the need to consider modifications to the transportation network as the area evolves and potential interventions by mode. The approach provided in the FEIR incorporates comments provided by the MEPA office, MassDOT and the City during recent coordination meetings regarding this FEIR.

MEPA.17 **Include a contingency plan for identifying and implementing additional transit, bicycle and pedestrian mitigation measures that could be implemented by the Proponent, the City and/or the MBTA. These measures may include changes to specific bus routes, additional busses or trains, bus lanes or prioritization, intersection improvements, traffic signal phasing adjustments and TDM measures.**

Section 2.5 includes information on transportation-related mitigation, and potential measures that could be implemented if certain conditions occur during the development of the Project. The approach provided in the FEIR incorporates comments provided by the MEPA office, MassDOT and the City during recent coordination meetings regarding this FEIR.

MEPA.18 **The FEIR should address the need for and appropriateness of mitigation measures to correct safety-related deficiencies. The Proponent should develop this information in consultation with MassDOT and the City.**

Section 2.2 includes information regarding intersection safety and the need for and appropriateness of mitigation measures to address safety concerns. US2 has developed this information in consultation with MassDOT and the City.

MEPA.19 **The FEIR should include an expanded and more detailed traffic monitoring plan that will provide the necessary data for on-going analysis of transportation conditions and decisions regarding the need for additional mitigation measures. The monitoring plan should include:**

- **Simultaneous automatic traffic recorder (ATR) counts at each site driveway for a continuous 24-hour period on a typical weekday;**
- **Travel survey of employees and patrons at the site;**
- **Updates on the TDM plan implementation;**
- **Bicycle usage data;**

- **Weekday AM and PM turning movement counts (TMCs) and operations analysis at key intersections within the study area;**
- **Crash data and analysis for the HSIP locations in the study area;**
- **Pedestrian counts at the HSIP locations, and**
- **Transit (bus and train) ridership counts.**

Section 2.7 includes information regarding the monitoring plan, including the measures provided in the Certificate and outlined above.

MEPA.20 **The FEIR should include a section that provides detailed information, including plans, which reflect the project's coordination with the GLX. The section should address MassDOT concerns and include responses to MassDOT comments. It should provide detailed plans of proposed vehicular, pedestrian and bicycle access to Union Square Station, including any access to be provided from the Prospect Street Bridge.**

The FEIR addresses these matters. Section 1.3 includes information regarding coordination with the GLX project and responses to MassDOT's comments (which are also included in the response to MassDOT's comment letter included in this chapter). The FEIR also includes detailed plans of proposed vehicular, pedestrian and bicycle access to Union Square Station, including on Figures 1-8 and 1-9, as well as a discussion of US2's efforts to work with the GLX project team to allow the MBTA to incorporate an elevator into its project. These efforts have included offering to provide, at no cost to the MBTA, easements rights to accommodate the MBTA elevator, and to contribute to the cost of the installation of the MBTA elevator. See also the response to comment MEPA.22 below.

MEPA.21 **The FEIR should include a discussion of the feasibility of providing an elevator to the station and review potential locations and designs.**

As discussed in Section 1.3, US2 has been collaborating with the MBTA, GLX project team and City to evaluate the feasibility of providing an elevator at the station to serve MBTA patrons. This service area includes portions of Somerville and Cambridge south of the MBTA right-of-way (see Figure 1-22). In order to contribute to improving circulation from the station to the Prospect Street bridge, US2 has offered to amend the D2 design to provide, at no cost to the MBTA, easement rights on the D2 property as required to make way for the MBTA elevator and/or to install a stair adjacent to the MBTA elevator location. US2 has also offered to contribute to the cost of the MBTA elevator's installation. US2 will continue to coordinate with the MBTA, the City and other stakeholders on this issue and remains hopeful that a solution for the MBTA elevator can be identified.

MEPA.22 **Many commenters, including MassDOT, requested additional details about the civic space proposed along Prospect Street and how it will provide access to the station. The FEIR should provide detailed plans of the open space, including proposed grades, surface treatments, and pedestrian and bicycle facilities. The FEIR should clearly demonstrate that the project will provide ADA-compliant access to the station. It should identify the location and design of all amenities the Proponent is required to provide in connection with the MBTA station.**

The FEIR provides detailed plans of the D2 civic open space. These include what is set forth in Section 1.2.4.4, which includes additional details and plans related to the D2 civic open space proposed along Prospect Street and how it will provide access to the station. Figure 1-8 is a detailed site plan for the D2 Block with periodic clear-widths dimensioned along the primary path of travel. Figure 1-9 depicts D2 site circulation for various modes of travel, including pedestrian and bicycle facilities. Section 1.3 further discusses the coordination between US2 related to GLX, and the improvements and amenities that US2 has agreed to provide in connection with Union Square Station. Figure 1-21 identifies the location and design of all amenities US2 will be providing in connection with the MBTA station, including: MBTA operator's breakroom, accessible restrooms, and janitor's closet; The Ride para-transit drop-off area; bicycle parking and the ADA-compliant access across the D2 civic open space to the station. Figure 1-10 identifies proposed grades and specific features of the civic open space. The portion of the civic open space that provides the ADA-compliant path will be a material consistent with MBTA standards and will designed to ADA standards for minimum width, longitudinal slope and cross slope.

MEPA.23 **The DEIR provided a summary of the shared parking demand model used to calculate the peak parking demand. The FEIR should provide more detail about the model and its assumptions, as requested by MAPC.**

Section 2.3 and Appendix D3 provide a description of the shared parking model used for the Project used to calculate the peak parking demand, and provides more details about the model and its assumptions.

MEPA.24 **The FEIR should address how shared parking will be provided and managed during the phased build-out of the project.**

Section 2.3.2 describes how the parking facilities will be realized and managed over time with the implementation of each Lot.

MEPA.25 **The FEIR should analyze the energy savings and reductions in GHG emissions that would be achieved by constructing buildings in accordance with Passive House design standards.**

The FEIR includes a thorough Passive House analysis based on the analysis scope most recently discussed with MEPA and DOER. This study quantifies the estimated energy savings and reductions in GHG emissions that would be achieved by constructing buildings in accordance with Passive House design standards. It also estimates the development cost premiums and risks associated with pursuing Passive House. Please refer to Section 3.4 and Appendix E for further information.

MEPA.26 **Identify financial incentives available for Passive House design construction, incorporate incentives into cost estimates and analyze the feasibility of constructing the proposed buildings to those standards. The Passive House cost evaluation should reflect the economies of scale that can be achieved by the project.**

The FEIR includes a thorough Passive House analysis. This study identifies financial incentives available for Passive House design construction, incorporates incentives into cost estimates and analyzes the feasibility of constructing the proposed buildings to those standards. The financial incentives were estimated based on information on the current incentive programs provided by the program providers and a projection of how those incentives would be applied to the proposed buildings. Please refer to Section 3.4 and Appendix E for further information.

The DEIR Certificate asked that the Passive House cost evaluation reflect the economies of scale that can be achieved by the Project. Since the Project will be largely financed Lot by Lot over a period of time like many other large-scale Projects, each individual Lot must be financially feasible on its own. Construction for each Lot will also be procured individually and from contractors best suited for that particular product type (i.e., mid-rise residential, lab/office, office, hotel, high-rise residential, etc.). Consequently, it is difficult for the Project to take advantage of economies of scale with respect to Passive House. However, as described in Section 3.6, the Project does hope to take advantage of its scale for PV implementation on the rooftops.

MEPA.27 **The City has adopted a goal of becoming carbon neutral by 2050. DOER's comment letter identifies opportunities for the project to make a meaningful contribution towards that goal. The FEIR should address the project's consistency with that goal.**

The FEIR describes the Project's consistency with City's carbon neutrality goals in Section 3.6, identifying the action plans in place to assess compliance and ensure that the Project will remain current within the changing context of incentives, system technology, and material science that will inform new paths to resilience and carbon neutrality over the long term.

The Project, through the FEIR, has advanced study around Passive House (Section 3.4), building electrification (Section 3.5), renewables (Section 3.7), and purchase of carbon offsets; all stated objectives of Somerville Climate Forward (2018). These studies, in

parallel with Somerville's Sustainable and Resilient Buildings Questionnaire, required for each Development Review Application, will demonstrate consistency with the City's carbon neutrality goal over time.

In the near term, and absent certainty around future incentives, commitments to Passive House achievement, set-aside area for photovoltaics, green-power purchasing, and green vehicle infrastructure, position the Project as a resilient model to follow. Please refer to Chapter 3 for details.

MEPA.28 **Include commitments to build one or more multi-family buildings to Passive House standards and/or incorporate electric heat and hot water into the project design.**

US2 has committed to building D4.3 as a Passive House multi-family project with electric heat and hot water. Please refer to Section 3.4 for details.

MEPA.29 **The FEIR should include an evaluation of additional scenarios associated with an aggressive electrification approach based on projected long-term declining emission rates of the Commonwealth's electrical grid.**

The FEIR includes a thorough analysis of potential HVAC electrification. This study includes an evaluation of additional scenarios associated with an aggressive electrification approach based on projected long-term declining emission rates of the Commonwealth's electrical grid. The analysis will form the basis for continued evaluation of electrification approaches as the Project is implemented. Please refer to Section 3.5 and Appendix E for further information.

MEPA.30 **The City will be not be permitted to convey stormwater flows to the MBTA's system if flood levels rise to six inches below the top of the MBTA's commuter rail tracks. The DEIR did not address how stormwater will be managed when flows cannot be directed into the MBTA's system or how the site would be affected under such circumstances. The Proponent should consult with the City regarding the expected frequency of flood events of this magnitude and how the City intends to address the limitation. This information should be provided in the FEIR, including any on-site resiliency or storm water management measures that may be necessary.**

Chapter 4 describes the stormwater system, how stormwater will be managed when flows cannot be directed into the MBTA's system, and how the site would be affected under such circumstances. In the event the water level reaches the six-inch threshold below the rail tracks, the stormwater will be directed to the MWRA storm sewer system. On-site resiliency and stormwater management measures will be employed on a Lot-by-Lot basis to mitigate flooding frequency as further described in Chapter 4.

The Proponent has consulted with the City regarding the expected frequency of flood events of this magnitude and how the City intends to address stormwater management. Upon reaching an elevation six inches below the commuter rail tracks, stormwater that cannot be pumped by the MBTA system will (as in the existing condition) flow by gravity to the MWRA storm sewer system and will ultimately be pumped to the Deer Island Wastewater Treatment Plant. US2 has discussed the operation of the pumping station with the City, and both parties acknowledge that the agreement with the MBTA will result in the diversion of stormwater during most storm events, resulting in a decreased impact on the combined sewer systems that ultimately flow to Deer Island and resulting in fewer overflows of the combined sewer system. US2 will continue to coordinate with the City as required through Project implementation to ensure that Project stormwater management systems appropriately connect to the City's evolving and improving stormwater management system.

MEPA.31 **The FEIR should include a separate chapter that summarizes measures to avoid, minimize and mitigate environmental impacts and to provide public benefits. For each phase, the FEIR should include draft Section 61 Findings for the SRA and any other Agency that will take Agency Action. The proposed Section 61 Findings should specify in detail all feasible measures that the Proponent will take to avoid, minimize and mitigate potential environmental impacts to the maximum extent practicable. The draft Section 61 Findings should clearly identify parties responsible for funding and implementation, and the anticipated implementation schedule that will ensure mitigation is implemented when appropriate in relation to environmental impacts.**

Chapter 5 includes a list of measures to avoid, minimize and mitigate environmental impacts and to provide public benefit, responsible parties, anticipated costs (if available), and schedules for implementation. Chapter 5 also includes a proposed Section 61 finding that can be used by any Agency that will take Agency Action.

MEPA.32 **The FEIR should include a commitment to provide a self-certification to the MEPA Office at the completion of each phase of the project.**

The FEIR contains a commitment to provide a self-certification to the MEPA Office at the completion of each phase of the Project. Please refer to Section 3.9.3 for details.

MEPA.33 **The FEIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the FEIR should include direct responses to comments, to the extent that they are within MEPA jurisdiction. The responses should not refer to a chapter or section of the FEIR. As noted above, the Proponent is being afforded another opportunity to provide direct responses to comments on the EENF.**

The Certificate has been included in this chapter, along with comment letters on the DEIR and responses to those comments. Revised responses to comments on the ENF have been included in Appendix F.

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

March 1, 2019

Matthew A. Beaton, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Somerville
Union Square Redevelopment
Union Square
EEA # 15889

Attn: MEPA Unit

Dear Secretary Beaton:

The Department of Environmental Protection has reviewed the Draft Environmental Impact Report, DEIR, submitted by Union Square RELP Master Developer LLC (US2) and Somerville Redevelopment Authority (SRA), for the proposed Union Square Redevelopment located in Somerville on an approximately 15.1 acre site. The MassDEP provides the following comments.

Wastewater

The Union Square Redevelopment Project (EEA #15889) is a multiphase and multiparcel redevelopment project spurred on by the MBTA's Green Line Extension Project (GLX). Green Line subway service will extend to a new MBTA train station at Union Square in Somerville, MA.

Wastewater connections will be made to the City of Somerville's wastewater collection system and flow will be conveyed to the MWRA's system for treatment at Deer Island. MWRA's Prison Point CSO facility receives combined sanitary and stormwater flows from this area and, during significant wet weather events, treated combined sewer overflow is discharged to the Charles River/Boston Harbor.

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

Printed on Recycled Paper

The DEIR indicates that the proposed project will generate increased wastewater flows of 140,585 gallons per day (gpd). MassDEP regulations at 314 CMR 12.04(2)(d) require sewer authorities with permitted combined sewer overflows, including the City of Somerville, to require removal of four gallons of infiltration and inflow (I/I) for each gallon of new wastewater flow generated for any new connection to their system where greater than 15,000 gallons per day of new wastewater flows will be generated. The Project proponent is contributing an estimated $3.5 million in I/I fees to the City to meet the 4:1 requirement. Additional I/I mitigation such as manhole sealing is being conducted by the City but it is unclear to what extent the work is directly related to reducing flows in the project area. The proponent should meet with staff from the City of Somerville to ensure that I/I mitigation requirements are met. DEP.1

The City is constructing an 800,000 gallon stormwater box culvert as part of the Somerville Avenue Utility and Streetscape Improvements project to mitigate peak stormwater discharge rates for this area. The new box culvert will collect and convey stormwater to the MBTA's stormwater conveyance system servicing the GLX project and discharge to the Millers River. Construction is slated to be completed prior to the start of the Union Square Redevelopment project. Stormwater discharge from the box culvert is limited legally to conditions set by the MBTA. Stormwater discharges from the City's connection must cease when flooding of the MBTA's Fitchburg Railroad Line is within 6-inches of the top-of-rail in a defined section of track. Additional stormwater flow from the City's Spring Hill area will also connect to the same MBTA connection point as the Union Square project. The City intends to construct a new stormwater pump station (Poplar Street Stormwater Pump Station) to make the connection to the MBTA's stormwater system and control the amount of flow discharged. It is unclear how flows will be managed once the MBTA stormwater/flooding threshold has been reached and stormwater discharge from the City's connection is terminated, and this issue should be assessed in the Final EIR. DEP.2

The MBTA and the City of Somerville are party to an existing NPDES Discharge Permit for stormwater being conveyed to the Millers River. The MBTA is also subject to an Administrative Consent Order (ACO) with MassDEP related to stormwater discharges to the Millers River. Stormwater BMPs will be implemented by the project proponent to address phosphorus pursuant to the Total Maximum Daily Load (TMDL) established to control phosphorus loads to the Charles River.

The FEIR should more fully identify any deficiencies in the wastewater/CSO system serving the project site and confirm that the system has sufficient capacity to accept flow under the planned level of control. DEP.3

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Kevin.Brander@state.ma.us at (978) 694-3236 for further information on wastewater issues. If you have any general questions regarding these comments, please contact me at John.D.Viola@state.ma.us or at (978) 694-3304.

Sincerely,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Eric Worrall, Kevin Brander, MassDEP-NERO

6.3 Agency Comment Letters

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP.1 **The proponent should meet with staff from the City of Somerville to ensure that I/I mitigation requirements are met.**

US2 met with representatives of the City's engineering department to discuss the 4:1 infiltration/inflow mitigation policy and its application to the Project. Coordination with the City will continue throughout the development of the Project in order to ensure that I/I mitigation requirements are met.

DEP.2 **The City intends to construct a new stormwater pump station (Poplar Street Stormwater Pump Station) to make the connection to the MBTA's stormwater system and control the amount of flow discharged. It is unclear how flows will be managed once the MBTA stormwater/flooding threshold has been reached and stormwater discharge from the City's connection is terminated.**

As described in Chapter 4, the MBTA stormwater mitigation system is intended to pump stormwater from the City infrastructure in all storm events until water levels reach an elevation six inches below the commuter rail tracks. As flood levels approach the six-inch threshold, the pump rate will slowly decrease, and pumping will stop when water levels reach the six-inch threshold. As water levels decrease below the six-inch threshold, the pump rate will increase.

Stormwater that cannot be pumped to the MBTA system will (as in the existing condition) flow by gravity to the MWRA storm sewer system that is ultimately pumped to the Deer Island Wastewater Treatment Plant. US2 has discussed the operation of the pumping station with the City, and both parties acknowledge that the agreement with the MBTA will result in the diversion of stormwater during most storm events, resulting in a decreased impact on the combined sewer systems that ultimately flow to Deer Island and resulting in fewer overflows of the combined sewer system.

DEP.3 **More fully identify any deficiencies in the wastewater/CSO system serving the project site and confirm that the system has sufficient capacity to accept flow under the planned level of control.**

The Project will result in improved sewer capacity within the City's wastewater/CSO systems as infiltration and inflow mitigation, along with the City's Utility and Streetscape Improvement project, will remove flows from the combined system.

The capacities of the existing sanitary and combined sewers were analyzed and provided as part of the DEIR and can be found in Table 10-2 of the DEIR. Additionally, the impact of the Project's sanitary sewer discharge to the existing system can be found in Table 10-3 of the DEIR. As shown on these tables, it is anticipated that the sewer system has capacity for the Project.

With the planned connection from the City's stormwater system to the MBTA's stormwater system, and with the removal of flows from the CSO system through I/I mitigation, it is anticipated that there will be increased capacity in the City's systems. For the Project's first phase (i.e., D2), during storm events that result in surcharging in the City's CSO system, check valves installed in the Project's sanitary sewer system will prevent flow from the surcharged CSO system from backing up into the site, and an overflow tank will be constructed on site and sized to store 24 hours of flow from the D2 buildings.

The proposed connections to the City sewer will be reviewed through the City's DSPR process and building permit process for each development Lot prior to construction. The construction site plans will indicate existing and proposed sanitary sewers, combined storm sewers, and storm drains to ensure conformance with local design standards for wastewater.

COMMONWEALTH OF MASSACHUSETTS
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Karyn E. Polito
Lt. Governor

Matthew A. Beaton
Secretary

Judith F. Judson
Commissioner

5 March 2019

Matthew Beaton, Secretary
Executive Office of Energy & Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02114
Attn: MEPA Unit

RE: Union Square Redevelopment, Somerville, Massachusetts, EEA #15889

Cc: Maggie McCarey, Director of Energy Efficiency, Department of Energy Resources
Judith Judson, Commissioner, Department of Energy Resources

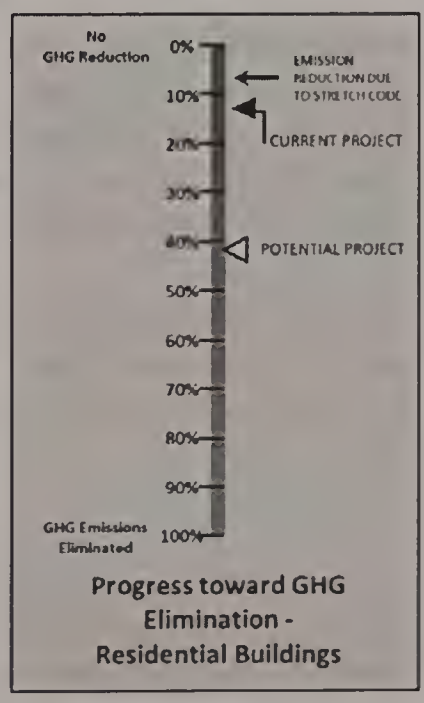
Dear Secretary Beaton:

We've reviewed the Draft Environmental Impact Report (DEIR) for the above project. The proposed project consists of approximately 2.3M sf of built-space (about 1M sf of residential multifamily (about 1,000 units) and 1.3M sf of office, retail, and hotel.) Construction is expected to extend to about 2036. Our analyses herein describe emissions impact through 2050.

Our key findings:

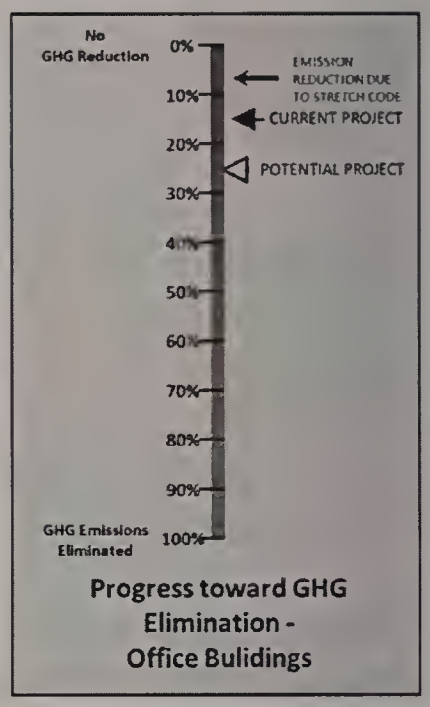
- The currently-proposed Mitigation Level for the residential portion of the development is 7%. Mitigation Level for the residential buildings can be increased by a factor of more than five (e.g. five times more mitigation) to 36% with electrification, Passivehouse, and solar PV.

- The currently-proposed Mitigation Level for the office portion of the development is also 7%. Mitigation Level for the office portion of the development can be increased by a factor of 2.5 (e.g. more than doubling mitigation) to 18% with electrification.



Progress toward GHG Elimination - Residential Buildings

- Passivehouse is likely the most promising emission reduction strategy and will likely greatly improve affordability and resilience. Unfortunately, Passivehouse was largely unevaluated in the DEIR. The conclusion in the DEIR that Passivehouse is infeasible is unsubstantiated.



The DOER also reviewed emissions over the long term, projecting emissions through 2050, a timeframe consistent with Somerville Climate Forward climate change plan[1]. This analysis demonstrates that it's possible to reduce emissions to less than 2,900 tons per year by 2050 using a combination of Passivehouse and electrification of space and water heating. This is about 70% less emissions than if the buildings are built to current Code.

Project Timeline and Phases

The project includes construction of about 17 large buildings having an average size of 140,000-sf each over 3 phases, as summarized in Table 2:

Phase	Number of buildings	Area in Phase (Million sf)
1	3	0.6
2	2	0.4
3	12	1.3

Summary of Proposed Construction

Total project duration is about 17 years, roughly from year 2020 to year 2036. This extended construction duration allows for opportunities to revisit emissions strategies and check-in on emissions progress.

The 17-year construction time horizon means that the project will be built under multiple different building energy code updates, with MA and the national model energy codes expected to progress and improve. This duration will also span no less than five, and possibly six, cycles of MassSave® utility incentive program designs. The most recent program design has developed new incentives strategic electrification, and, specifically for new construction programs, has a new program offering for Passivehouse, anticipating less reliance on lighting improvements.

Potential code changes, combined with technology advancements, changes in cost of construction and available incentives, and changes in utility costs, has design implications for the project developer on infrastructure investments such as how much natural gas or electric capacity to plan for.

[1] Somerville Climate Forward, November 2018

The next few sections of this letter present an evaluation of mitigation approaches using current electric grid emissions in a manner consistent with current MEPA Policy and Protocol for emissions evaluation[2].

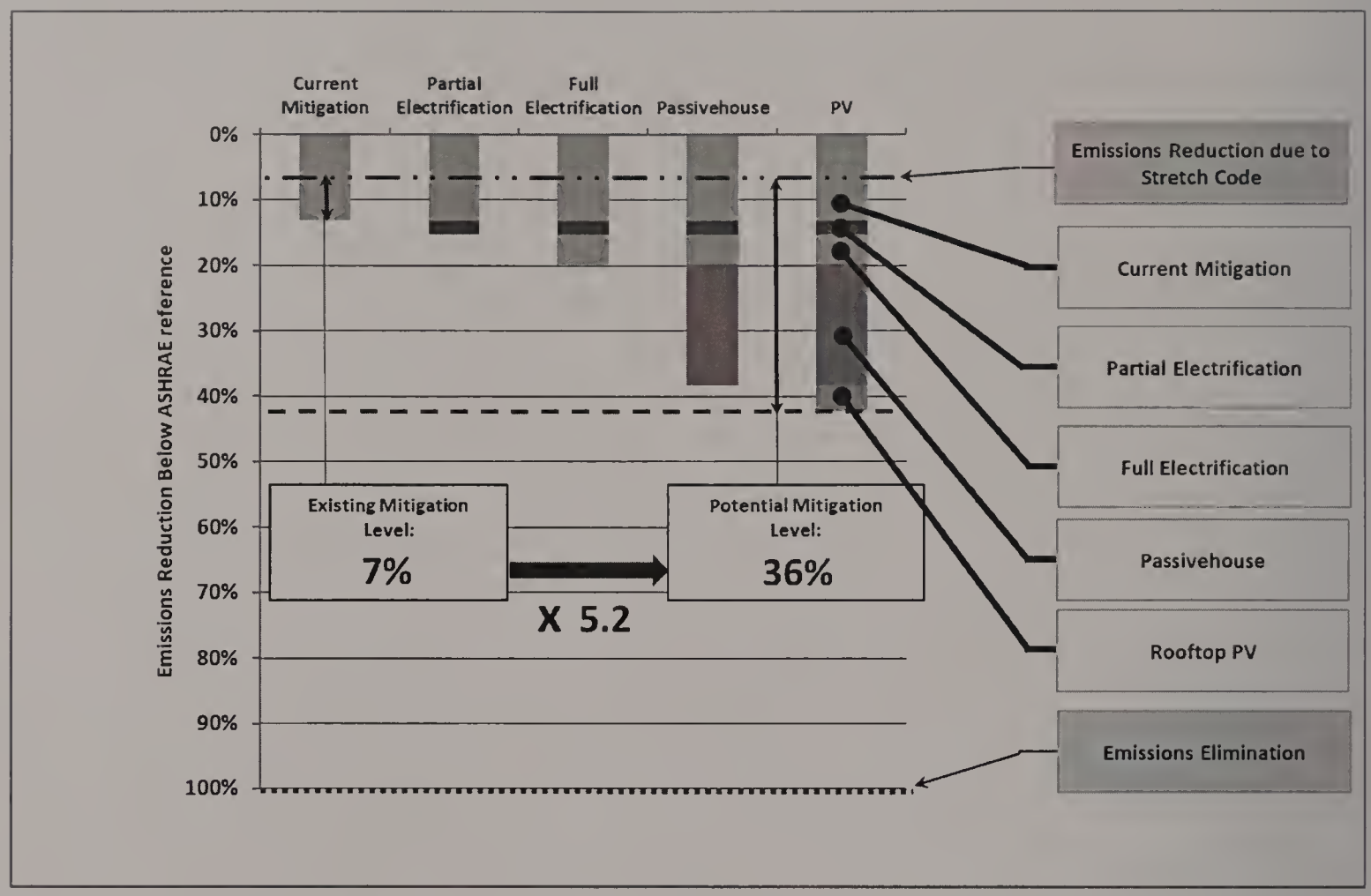
However, given the lengthy development timeframe for this project, the last section of this letter ("Emissions 2020 to 2050") presents a more informative mitigation analysis which considers both project build-out over time and forecasted grid emissions improvements.

Pathway to 41% Mitigation Level – Residential

As illustrated on the next page, the project can achieve a 36% Mitigation Level[3] for the residential portion of the project using the following strategies:

- The currently-committed efficiency strategies (largely improved HVAC and reduced lighting) deliver a Mitigation Level of 7%.
- Mitigation Level can be improved to 36% by:
    - Utilization of the VRF approach described in the submission ("alternative 3"). This improves Mitigation Level to 9%. Herein, this approach is referred to as "Partial Electrification" as it converts some, but not all, space and water heating from gas to electric;
    - Fully electrifying space and water heating would improve Mitigation Level to 14%.
    - Achieving Passivehouse would improve Mitigation level to 32%
    - PV on the roof (total of 805kW) would improve Mitigation Level to 36%.

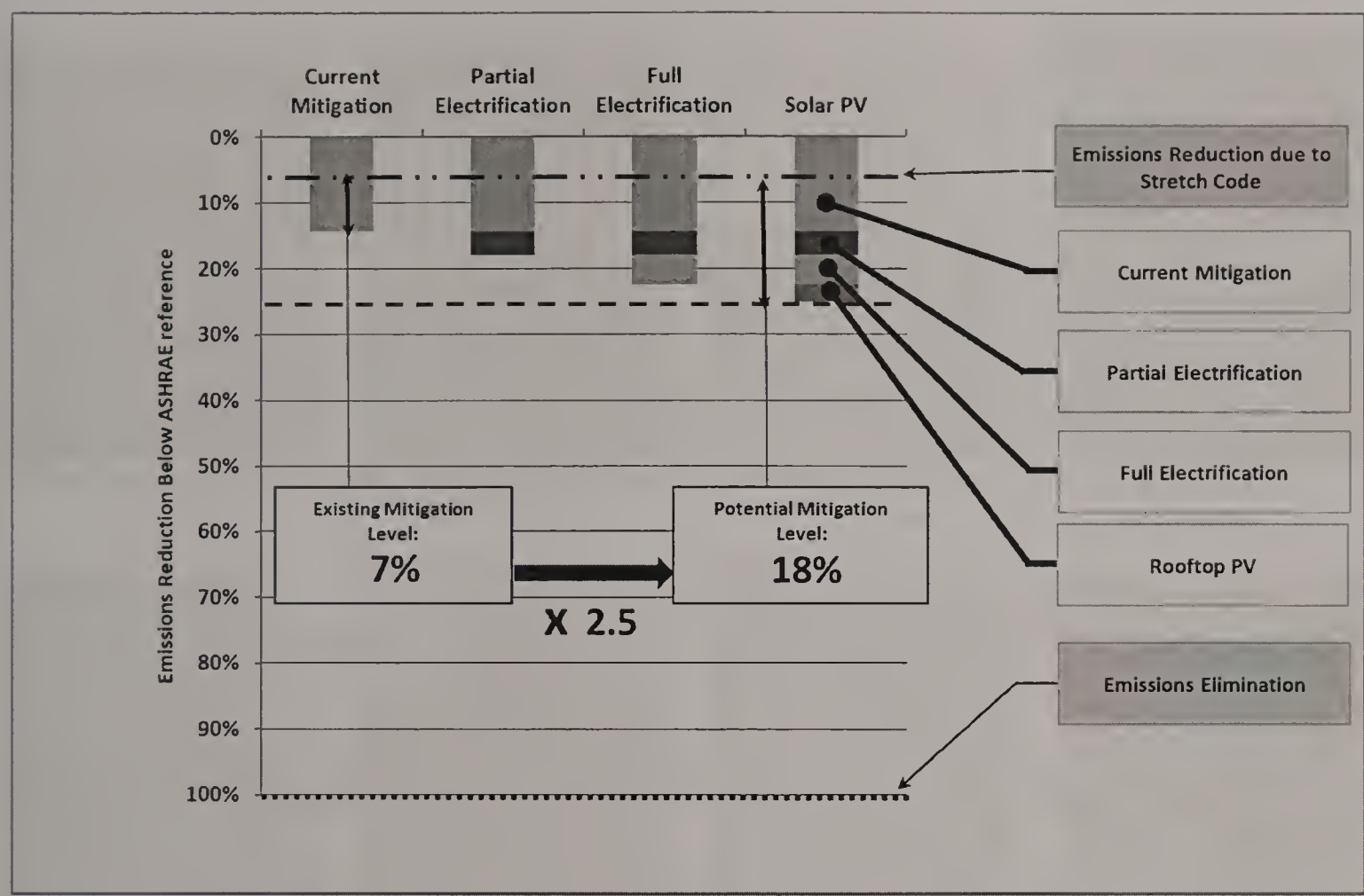
[2] https://www.mass.gov/files/documents/2016/08/rp/ghg-policy-final-summary.pdf
[3] Mitigation Level is the percent GHG reduction beyond the reduction that would occur as a result of following state and local building codes. A Mitigation Level of 0% means that no mitigation is proposed.



Pathway to 18% Mitigation Level – Office

As illustrated on the next page, the project can achieve an 18% Mitigation Level for the office portion of the project using the following strategies:

- The currently-committed efficiency strategies (largely improved HVAC and reduced lighting) deliver a Mitigation Level of 7%.
- Mitigation Level can be improved to 18% by:
  - Partial electrification (utilization of the VRF approach described in the submission) improves Mitigation Level to 11%.
  - Fully electrifying space and water heating would improve Mitigation Level to 15%.
  - PV on the roof (total of 670kW) would improve Mitigation Level to 18%.



Passivehouse

Recommended Evaluations

The following was Recommendation Number 1 from our ENF dated 21 August 2018, referencing recommendations for the DEIR.

> "Passive design for the residential portions of the project should be thoroughly evaluated.
>
> As part of Passive evaluations, we recommend that a thorough investigation be performed for: Alternative Energy Credits, utility benefits, MCEC grants, and other incentives. We recommended meeting with the utilities to confirm incentive level, including incentives for the high performance enabled by Passivehouse."

Unfortunately, Passivehouse was largely unevaluated in the DEIR. The filing did not contain any information on Alternative Energy Credits, utility (MassSave®) incentives, and estimated utility savings. Critically, the submission provided no information or analyses of emissions reduction. The proponent's conclusion in the DEIR that Passivehouse is financially infeasible is unsubstantiated.

Passivehouse Benefits

In the ENF stage, the DOER estimated Passivehouse benefits, as follows:

- Average unit utility cost could be reduced from $2,800/yr to $700/yr, saving each unit about $2,100/yr[4], improving affordability. Across all units, Somerville residents would be saving about $10M in the first decade.

- Passive multifamily usually costs more to build than code multifamily. An extensive study by NYSERDA for a similar urban-setting residential multifamily tower found that Passivehouse improvements cost about $8.88/sf more to build. However, Massachusetts uniquely provides large incentives that a Passivehouse multifamily could qualify for which would reduce costs, including:

    - Alternative Energy Credits.
    - MassSave® performance-based utility incentives for high-rise multifamily (to be determined by the utility)

- We estimated that, with AECs and Massachusetts utility rates, payback of Passivehouse would be within an few years. MassSave incentives would further improve this payback.

- Passivehouse also provides other attractive benefits to future tenants or buyers, including:

    - Noise reduction
    - Indoor air quality improvements
    - Comfort improvements
    - Higher quality doors and windows

- Passivehouse would also greatly improve resiliency as Passivehouse units can stay warm (or cool, in summer) for extended periods even with loss of active space conditioning equipment.

Passivehouse Examples

The proponent cites that there are few examples of Passivehouse projects in the Boston area. While this is true, there are dozens of examples of multifamily Passivehouse projects in similar climates and urban settings that demonstrate the feasibility. In fact, Passivehouse projects can be found in every region of the country and in every climate zone. Dozens of large Passivehouse projects are built or are being designed now in the northeast. Below are a few selections which include mid-rise and high-rise as well as luxury and affordable projects. If the proponent is seeking experience and information on Passivehouse, the proponent can reach out to the design teams and developers of these (and other) projects.

[4] Using $0.21/kWhr and $1.1/therm

511 East 86th Street
New York City, NY

Cyprus House
New York City, NY

466 Columbus Avenue,
New York City, NY

Chestnut Commons
New York City, NY

465 Washington Street,
New York City, NY

Sendero Verde
New York City, NY

The Distillery
Boston, MA

11 Crown Street
Meriden CT

Envelope Performance and Tradeoffs

The project is proposing various HVAC and lighting measures to deliver mitigation. To preserve the effectiveness of these measures, however, it is necessary to build the envelope as described by the code. Any relaxation of prescriptive code envelope results in **trading-off** the gains provided by HVAC and lighting improvements with the losses due to reduced envelope performance. Envelope performance is negatively impacted by:

- Using more windows than prescriptively described by the code;
- Using "curtain wall" assemblies, rather than framed, insulated wall assemblies described in the code.

The project has been responsive to ensure that some building types will have envelope performance that exceeds code standards. Also, the project is largely avoiding curtain walls. Some buildings types, however, are still proposed to have envelope performance lower than code. In summary:

Building Type	Envelope Performance	Recommendation
Group 1 Lab Office	2% higher than Code	
Group 2 Large Office	Approx. Code	
Group 2 Medium Office	Approx. Code	
Group 4 Small Office	16% lower than Code	Eliminate curtain wall and revert to Code 31% window from 40% window.
Group 5 Midrise Hotel	7% lower than Code	Revert to Code 34% window from 40% window.
Group 6 Large Residential	7% lower than Code	Revert to Code 40% window from 45%
Group 7 Large Residential	2% higher than Code	
Group 8 Midrise Residential	2% higher than Code	

For all three buildings, only minor changes are needed to achieve code performance. In all cases, simply reverting to back to Code-specified levels of window area would bring restore envelope performance.

Buildings having a lower performing envelope have increased emissions, are less comfortable, cost more to operate and are less resilient.

Electric Space and Service Water Heating

Electrification of space and service water heating is an effective strategy for GHG mitigation. Electrification entails swapping from gas-fueled equipment to electric heat pumps and VRF systems.

The proponent was responsive to include an evaluation of VRF systems for some space heating. This partial electrification would improve Mitigation Level by up to 57% as follows:

	Current Mitigation Level	Mitigation Level Partial Electrification	Improvement to Mitigation Level
Office	7%	11%	57%
Residential	7%	9%	28%

Alternatively, all space and water heating can be electrified. Full electrification would improve Mitigation Level by more than 100% as follows:

	Current Mitigation Level	Mitigation Level Full Electrification	Improvement to Mitigation Level
Office	7%	15%	114%
Residential	7%	14%	100%

The above emissions benefits are based on current electric emission rates. Emission benefits increase over time as the electric grid improves into the future. An analysis of this is presented in the last section of this letter.

Space Heating with Heat Pumps and Alternative Energy Credits

Space heating with eligible heat pumps could qualify for Alternative Energy Credits (AECs). The value of these credits could be approximately as follows[5]:

- $1.3 to $3M for the residential if issued as lump sum. The higher-end of this range reflects the bonus multiplier available if built to Passivehouse standards.

- $190,000 per year for the office and other spaces.

Solar PV

The project was responsive to evaluate availability of roof for PV for office and residential prototypes. Applied across the project, it appears that approximately 150,000-sf of space can be set aside for PV. This area could accommodate about 1,500 kW of PV.

Emissions 2020 to 2050

For this large project, the DOER analyzed the effect of mitigation measures considering the following:

- Project build-out over about 17 years; and
- Grid emissions using anticipated emissions rates for period 2020 through 2050

Emissions rates of Massachusetts' grid electricity (rates are in lbs of CO2 equivalent per MWhr) are expected to decline significantly due to the Commonwealth's commitments and policies[6]. Emission rates are expected to be about: 600 lbs/MWhr in 2030; 400 lbs/MWhr in 2040; and 200 lbs/MWhr in 2050. Current emissions are about 700 lbs/MWhr. Emissions for individual years in between are linearly interpolated.

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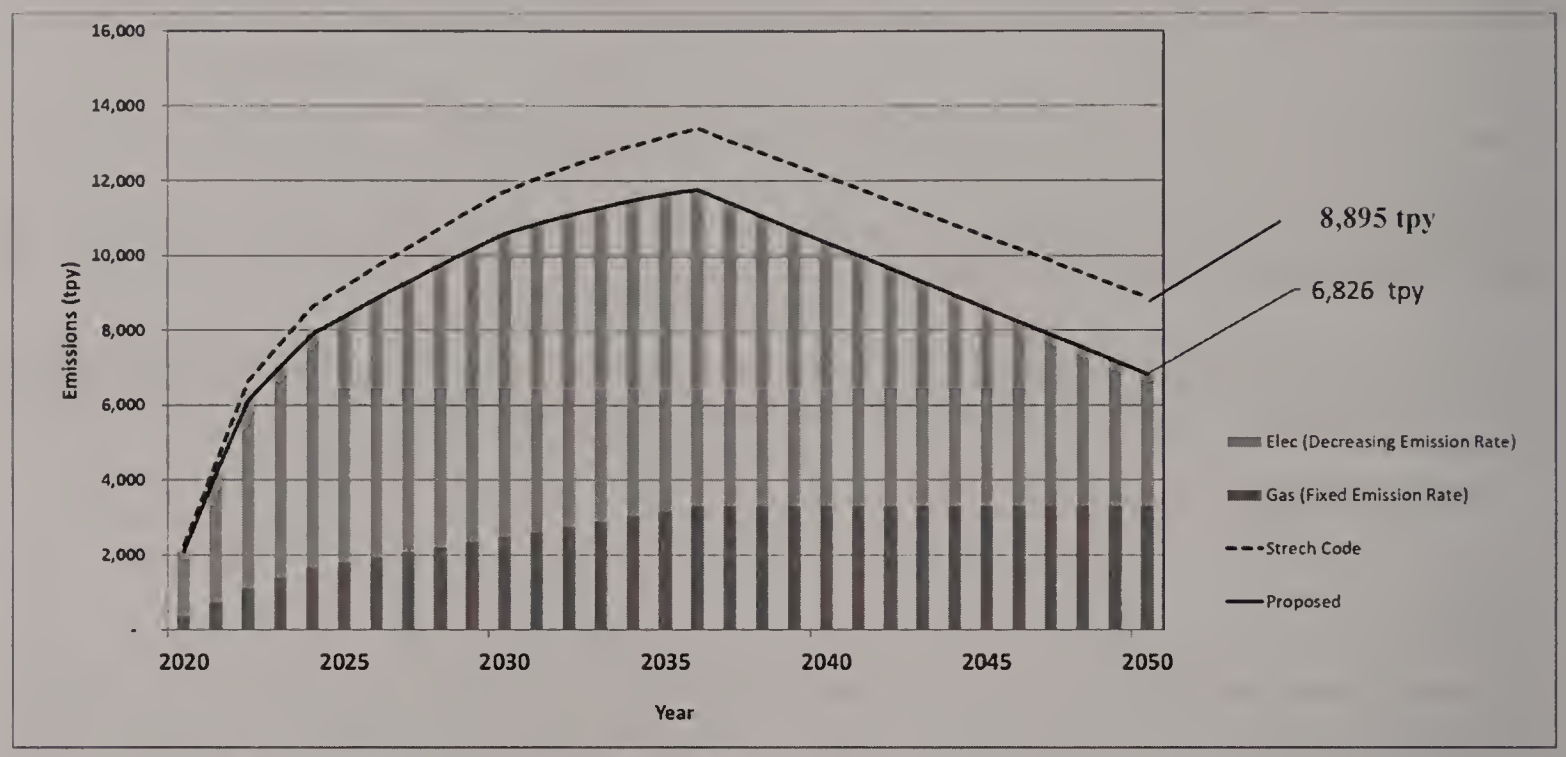
[5] Based on $20/AEC

[6] https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=fadee14ffc925769d112205e9322aee2&mc=true&r=PART&n=pt40.8.60#ap40.8.60_15580.2; and https://www.mass.gov/files/documents/2019/02/13/310cmr07.pdf

The following illustrates project emission profile for a project built to current Code and for a project as currently-committed.



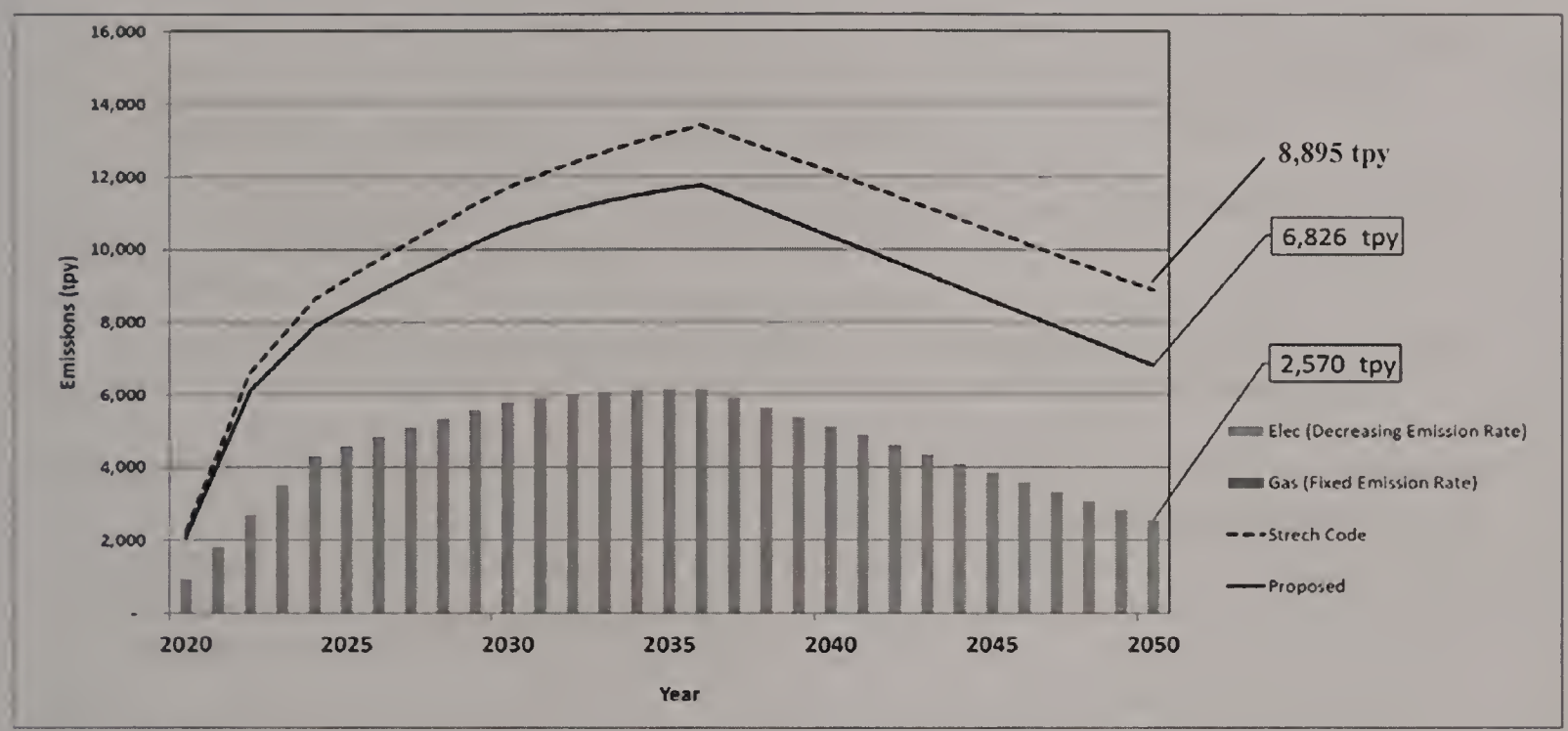
Project Emissions Profile (Current Commitments)

Built to current Code, emissions in the year 2050 would be 8,895 tpy. As currently committed, emissions in year 2050 would be 6,826 tpy, or, a 23% reduction.

The red bars in the illustrations represent the operational emissions associated with gas consumption (currently proposed for most space and water heating) while the blue represents the operational emissions associated with electricity consumption (all other energy uses). The stack of red and blue represent the total project operational emissions for the year shown in tons per year.

The initial climb in total emissions reflects project build-out over time as buildings come into service and begin consuming energy. Both gas and electric emissions increase initially as buildings come on line. However, as electric grid emission rates decline over time, project electric emissions growth slows, then declines. Natural gas emission rates are assumed consistent over over time and, as such, gas emissions grow in tandem with buildings coming on-line, then, stay constant thereafter.

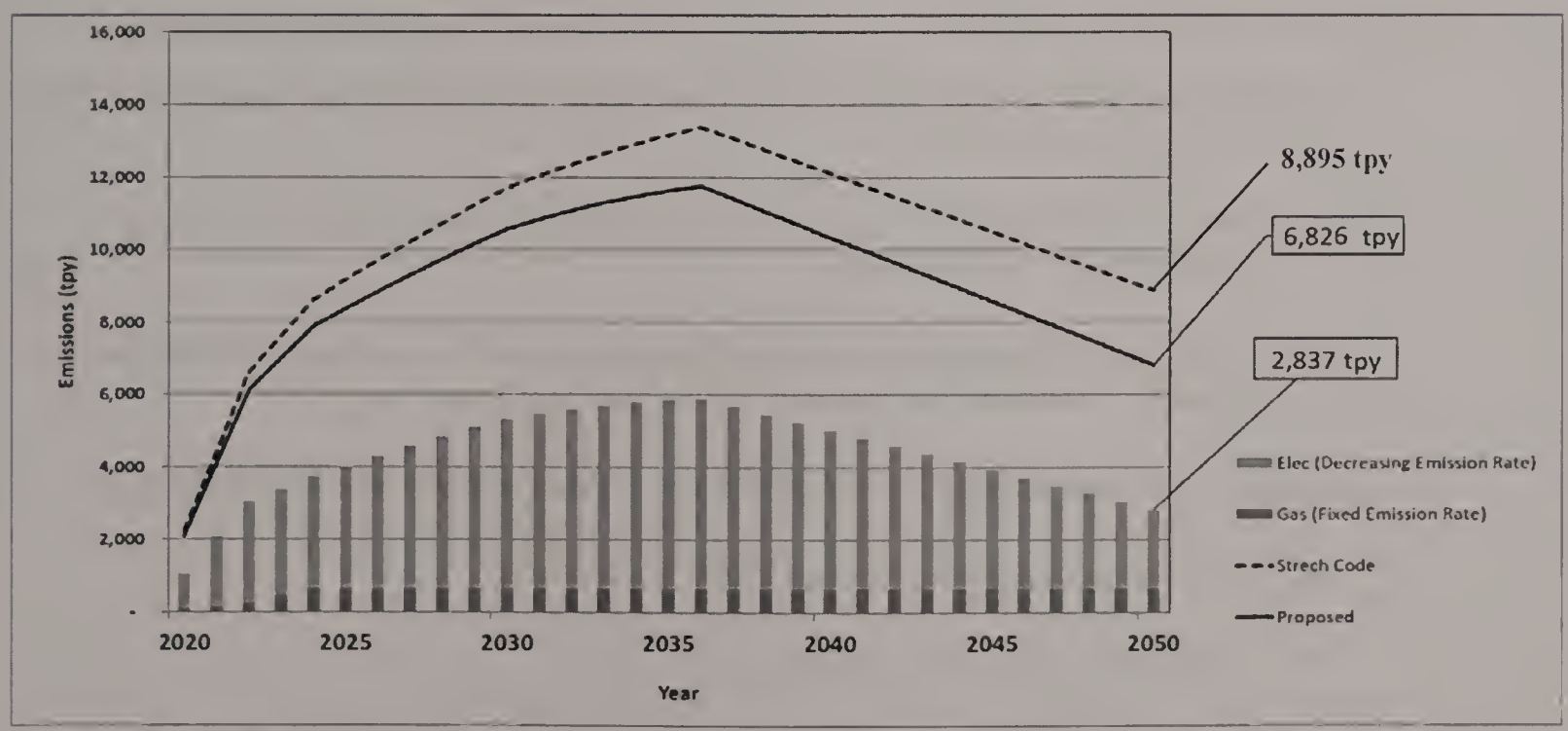
The figure below illustrates the approach of using all-electric space and hot water heating (all buildings) and Passivehouse for the residential buildings.



Project Emissions Profile (Office – all electric; Residential – all electric and Passivehouse)

This approach reduces emissions to 2,570 tpy, a 71% reduction from current Code.

An alternative scenario is illustrated below. In this scenario, the project is built using the Partial Electrification ("alternative 3") approach described in the DEIR for the first 5 years. Starting in 2025, all buildings are built fully-electrified and all residential buildings are built to Passivehouse.



Project Emissions Profile (First 5 years – Partial Electrification; after 2025, full electrification for all buildings and Passivehouse for residential)

This approach yields similar results. Year 2050 emissions are reduced to 2,837 tpy, a 68% reduction from Code.

Based on this "2050" analysis, DOER's recommend mitigation approach is as follows:

Years	Mitigation – Office	Mitigation - Residential
2020 to 2025	Partial Electrification ("Alternative 3")	Partial Electrification ("Alternative 3")
2025 onward	Full Electrification	Passivehouse and full electrification

Recommended Mitigation

The 2050 performance with this approach is about three times more effective than current commitments. In summary

	2050 Emissions (tpy)	Reduction from Current Code
Built to Current Code	8,895	
Current Commitment	6,826	23%
Recommended Mitigation	2,837	68%

Summary of Emissions Reduction

Recommendations

Our recommendations are as follows:

1. The project should be committed to achieving total project emissions of 2,900 tpy or less by 2050 using following strategy: DOER.1

    a. Between 2020 and 2025, partial electrification of all buildings as shown in "alternative 3" of submission;

    b. After 2025, full electrification of all buildings and Passivehouse for residential. Consider passivehouse for hotel, office, and retail uses, as well.

2. Project should commit to project updates every 3 years that report on the following: DOER.2

    a. Progress and projection toward 2,900 tpy by 2050;

    b. MassSave® updates and incentives;

    c. Building code updates and incentives;

    d. Passivehouse cost and economic updates by building type;

3. All buildings should have envelope performance (using the UA method) that exceeds Code. Tradeoffs should be eliminated. DOER.3

4. The project should meet with MassSave® in person and submit estimates of level of support for: DOER.4

    a. Buildings as proposed, but with full electric heat pump space[7] and water heating and code-level envelope;

    b. Passivehouse mid-rise, high-rise (also with full electric heat pump space heating and water heating). This should include both new construction performance incentive and any additional incentives for Passivehouse.

It's recommended that, for the residential buildings, energy analyses separate out the portion of the buildings that are ground-floor retail (and other non-residential uses) from the residential portion of the buildings so that the energy performance improvements as a result of Passivehouse is fully understood. DOER.5

5. The project should submit a detailed estimate of Alternative Energy Credit value, including scenarios for: DOER.6

    a. AEC estimate of buildings as proposed, but with full electric heat pump space heating;

    b. AEC estimate of Passivehouse with full electric heating and hot water

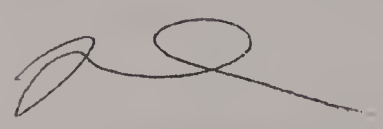
6. Detail roof plans should be submitted mapping out 150,000-sf of space for PV set aside. DOER.7

[7] "Heat pump" is used generically to mean any electric driven device that uses compression cycle to generate air or hot water useful for space heating

7. If the proponent does include an analysis for Passivehouse, the following should be estimated: DOER.8

    a. Emission reduction;
    b. Utility cost reduction;
    c. Cost addition due to improved envelope. For large Residential (model Group 6) comparison should be made against Code envelope, not lower-performing envelope proposed;
    d. Cost reduction due to downsized and reduced HVAC equipment;
    e. MassSave® incentive (both performance-based and additional Passivehouse incentives, per item 4b above)
    f. Alternative Energy Credit (AEC) value, including Passivehouse bonus multipliers.

Sincerely,



Paul F. Ormond, P.E.
Energy Efficiency Engineer
Massachusetts Department of Energy Resources

DOER.1 **The project should be committed to achieving total project emissions of 2,900 tpy or less by 2050 using following strategy:**

a. Between 2020 and 2025, partial electrification of all buildings as shown in "alternative 3" of submission;

b. After 2025, full electrification of all buildings and Passive House for residential. Consider Passive House for hotel, office, and retail uses, as well.

US2 is committed to reducing Project GHG emissions to the maximum extent feasible. Through the MEPA process, US2 has evaluated various building envelop and system designs in an effort to reduce GHG emissions within Project buildings as outlined in the FEIR, including both partial and full electrification of buildings and Passive House design. It is also anticipated that as the State Building and Energy Codes become more stringent, future buildings will also be more efficient, as they will be required to meet the Building Code at the time of building permit issuance. Commitments to mitigate stationary source GHG emissions have been made in the FEIR. Please refer to Section 3.9.

Beyond the modeled approaches to understand the benefits of electrification in reducing emissions included in the FEIR, US2 has consulted with engineers in the market to understand feasibility of implementation. It is readily understood that product type and scale factor considerably in determining feasibility which has resulted in a scarcity of large-scale, project precedents in the market. Similarly, the New England climate presents real challenges for VRF systems to support 100% outside air. VRF Efficiencies in tempering heat unfortunately do not correlate with like successes in handling the 0 degree or 98% saturated outside air extremes our climate can present. Provided these limitations and parallel demands for the significant coolant needs of large buildings, application of VRF systems could be implemented as a supplemental cooling source, in lieu of fan coils for example. In this mode, the benefit of providing for both heating and cooling is lost – compromising the efficiency intended of the product. The end result necessitates more system infrastructure within the building, further expanding costs and complexity in operations. In spite of these current challenges, the technology to make large-scale VRF applications more viable is advancing.

It is anticipated that partial electrification will be incorporated into future building designs; however, it is not possible for US2 to commit to a specific HVAC technology at this time. The barriers to implementation, paired with uncertainty around end users and their future needs, suggest a commitment of this kind, absent evolutions in technology, would preclude Life-Science tenants from these buildings, compromising the unique market opportunity available to Somerville and US2 to establish Union Square as the City's commercial center. Notwithstanding these difficulties, the FEIR contains a

thorough analysis of the application of electric systems across Union Square's building types. Please refer to Section 3.5 for details. US2 will continue to evaluate partial and full-electrification on a case-by-case basis as building projects are implemented.

Passive House is a building standard for ultra-low energy buildings that focuses on air tightness and a super-insulated building enclosure. Passive House principles are proposed in current designs across the Project. This FEIR contains a thorough Passive House Analysis of the mid-rise and high-rise multi-family residential buildings. Please refer to Section 3.4 and Appendix C for details. This study demonstrated that Passive House can produce energy benefits, but also comes at significant cost and risk given the nascent market. Through the MEPA process, US2 has come to understand the importance of establishing a Passive House market to the state, the City and the Somerville community. As such, despite the cost and risks associated with the design and construction of a Passive House building, US2 has committed to building D4.3 as a Passive House multi-family project. Please refer to Section 3.4 for details. In addition, US2 will consider Passive House for future residential, hotel, office, and retail uses in the Project. However, given the technological or financial challenges required to implement Passive House in today's market, many of these buildings may ultimately prove to be unsuited to Passive House certification. For this reason, US2 cannot commit to constructing all residential buildings built after 2025 to Passive House.

DOER.2 **Project should commit to project updates every 3 years that report on the following:**

a. Progress and projection toward 2,900 tpy by 2050;

b. MassSave® updates and incentives;

c. Building code updates and incentives;

d. Passive House cost and economic updates by building type;

As required by the GHG Policy, US2 has committed to provide a GHG self-certification at the completion of each construction phase, and phases are anticipated to be completed roughly every three years during the development of the Project, although this may occur less or more than every three years. US2 believes that this provides a logical timeframe in which to provide information that is relevant and up-to-date as buildings are designed and constructed. With the self-certification, US2 will provide information related to mechanical equipment installed, updated energy models, and details of incentives awarded. For the D4.3 Passive House project and if Passive House is pursued for other buildings, an economic update will be provided with the self-certification. GHG emissions will be estimated through updated modeling. MassSave incentive program updates, as well as Building Code updates and incentives will be included in the self-certification.

DOER.3 **All buildings should have envelope performance (using the UA method) that exceeds Code. Tradeoffs should be eliminated.**

All buildings have proposed building envelopes that exceed prescriptive code levels. Please refer to Section 3.3 for details.

DOER.4 **The project should meet with MassSave® in person and submit estimates of level of support for:**

a. Buildings as proposed, but with full electric heat pump space7 and water heating and code-level envelope;

b. Passive House mid-rise, high-rise (also with full electric heat pump space heating and water heating). This should include both new construction performance incentive and any additional incentives for Passive House.

The Project team met with MassSave in person as suggested by DOER in order to calculate the incentives available for the Project. Although MassSave does not provide incentive estimates, a MassSave representative reviewed the design team's approach to calculating whole-building incentives for commercial and residential new buildings. Because MassSave utilizes a unique way of calculating the baseline for their incentives purposes, incentives can only be estimated at this early stage of design. Please refer to Section 3.2 for details.

MassSave incentives have been estimated for the buildings as proposed, but with full electric heat pump space and water heating and code-level envelope. Please refer to Section 3.5 for details.

MassSave incentives have been estimated as part of the Passive House study. This includes full electric heat pump space heating and water heating. These incentives include MassSave's new construction whole-building performance incentive. There are no additional incentives for Passive House at this time. Please refer to Section 3.4 for details.

DOER.5 **It's recommended that, for the residential buildings, energy analyses separate out the portion of the buildings that are ground-floor retail (and other non-residential uses) from the residential portion of the buildings so that the energy performance improvements as a result of Passive House is fully understood.**

The FEIR contains a thorough Passive House analysis of the planned multi-family residential buildings. For purposes of the study, ground-floor retail has been excluded from energy analyses so that the energy performance improvements as a result of Passive House are fully understood. Please refer to Section 3.4 for details.

DOER.6 **The project should submit a detailed estimate of Alternative Energy Credit value, including scenarios for:**

a. AEC estimate of buildings as proposed, but with full electric heat pump space heating;

b. AEC estimate of Passive House with full electric heating and hot water

AECs have been estimated for a number of scenarios. These include buildings as proposed, but with full electric heat pump space heating, and the buildings designed to Passive House standards with full electric heating and hot water. Please refer to Sections 3.4 and 3.5 for details.

DOER.7 **Detail roof plans should be submitted mapping out 150,000-sf of space for PV set aside.**

US2 worked with Solect Energy to study the solar potential of the Project and to advise the developer of solar opportunities and considerations early in the planning process. Solect Energy is a top 10 solar provider in the United States and has installed over 90 megawatts of PV systems in 400 projects throughout the New England market. US2, in conjunction with Solect Energy, has identified solar-ready zones on many of the Project's rooftops, where it makes the most sense to locate future photovoltaic installations. After allowing space for conduit, access and setbacks, the resulting available area for solar PV set-aside was approximately 92,000 sf. In order to determine the roof area that could be committed to solar PV set-aside at this time, the commercial buildings that could be lab/office needed to be identified and excluded from the set-aside area. Lab/office buildings have significant rooftop HVAC requirements that take up a majority of the available rooftop area and leave little area for a solar PV installation. Lots D1.2, D3.1 and D3.3 are all identified as potential lab/office buildings and as such, a commitment to a PV solar set-aside on these rooftops cannot be made until the final use is determined. The resultant solar PV set-aside area after excluding Lots D1.2, D3.1 and D3.3 is approximately 40,000 sf. Please refer to Section 3.7 for additional information.

DOER.8 **If the proponent does include an analysis for Passive House, the following should be estimated:**

a. Emission reduction;

b. Utility cost reduction;

c. Cost addition due to improved envelope. For large Residential (model Group 6) comparison should be made against Code envelope, not lower-performing envelope proposed;

d. Cost reduction due to downsized and reduced HVAC equipment;

e. MassSave® incentive (both performance-based and additional Passive House incentives, per item 4b above)

f. Alternative Energy Credit (AEC) value, including Passive House bonus multipliers.

This FEIR contains a thorough Passive House analysis. This analysis includes emissions reduction estimates, utility cost reduction estimates, and estimated cost addition due to improved envelope. All comparisons have been made against the proposed, prescriptive-code exceeding envelopes. The NYSERDA recommended cost premium of $8.88 includes both the increase in the initial capital cost due to higher-performing envelope systems, construction methods, and testing, and the decrease in the equipment cost due to the significant reduction in heating and cooling loads.

As part of the analysis, MassSave incentives have been estimated. This includes full electric heat pump space heating and water heating. These incentives include MassSave's new construction whole-building performance incentive. These are no additional MassSave incentives for Passive House at this time. State AECs have also been included in the Passive House study. They include the bonus multiplier for Passive House-level performance. Please refer to Section 3.4 for details.

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

March 1, 2019

Matthew Beaton, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RE: Somerville: Union Square – DEIR
(EEA # 15889)

ATTN: MEPA Unit
Alex Strysky

Dear Secretary Beaton:

On behalf of the Massachusetts Department of Transportation, I am submitting comments regarding the proposed Union Square Redevelopment project in Somerville, as prepared by the Office of Transportation Planning. If you have any questions regarding these comments, please contact J. Lionel Lucien, P.E., Manager of the Public/Private Development Unit, at (857) 368-8862.

Sincerely,

David J. Mohler
Executive Director
Office of Transportation Planning

DJM/jll

Ten Park Plaza, Suite 4150, Boston, MA 02116
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www.mass.gov/massdot

cc: Jonathan Gulliver, Administrator, Highway Division
Patricia Leavenworth, P.E., Chief Engineer, Highway Division
Neil Boudreau, Assistant Administrator of Traffic and Safety Engineering
Paul Stedman, District 4 Highway Director
Office of Strategic Planning and Community Development, City of Somerville
Metropolitan Area Planning Council
Massachusetts Bay Transportation Authority
PPDU Files

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

MEMORANDUM

TO: David J. Mohler, Executive Director
Office of Transportation Planning

FROM: J. Lionel Lucien, P.E., Manager
Public/Private Development Unit

DATE: March 1, 2019

RE: Somerville – Union Square Redevelopment
(EEA #15889)

The Public/Private Development Unit (PPDU) has reviewed the Draft Environmental Impact Report (DEIR) submitted by Union Square RELP Master Developer LLC (US2) and the Somerville Redevelopment Authority (together, the Proponent) for the proposed Union Square Redevelopment project in Somerville. The overall development is proposed to involve the construction of 17 buildings, totaling approximately 2,360,000 square feet (sf) of residential, office, and commercial uses. The project also proposes approximately 157,000 square feet of new public open spaces, which includes 108,600 sf of new civic space, 27,000 sf of neighborhood space, and 15,100 sf of plaza that creates a point of entry and access to the new Massachusetts Bay Transportation Authority (MBTA) station. The project site is located in Union Square, which is also the location of a new MBTA station which will service the Green Line Extension (GLX) currently under construction and planned to open in 2021.

Based on the information presented in the DEIR, the Full-Build is expected to generate 27,963 unadjusted new trips on an average weekday, with 2,393 unadjusted new trips during the weekday morning peak hour, 2,911 unadjusted new trips during the weekday evening peak hour, and 2,103 unadjusted new trips during the Saturday midday peak hour. The project requires a Chapter 40, Section 54A approval from MassDOT.

The DEIR includes a Transportation Impact Assessment (TIA) that generally conforms with the current *MassDOT/EOEEA Transportation Impact Assessment Guidelines*.
The TIA describes the City of Somerville's efforts to promote alternate travel means such as walking, bicycling, and public transportation over driving. With this reasoning and in light of the extension of the Green Line to serve this area, MassDOT is supportive of the Proponent's mitigation program primarily focused on alternative modes of transportation. Additionally MassDOT, along with the MBTA GLX project team, has met on numerous occasions with the Proponent to discuss the project. The Final Environmental Impact Report (FEIR) should address the comments raised in this letter, particularly with regards to the transit mitigation component and GLX coordination.

Ten Park Plaza, Suite 4150, Boston, MA 02116
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Study Area

The study area includes a comprehensive number of intersections and connecting roadway segments as described in Figure 4-9 of the DEIR. The study area is considered to be acceptable and adequate in capturing the impact of the project on area roadways.

Trip Generation

The TIA uses trip generation rates from the Institute of Transportation Engineers (ITE)'s *Trip Generation Manual* (10th Edition). As presented in the TIA, trip generation was calculated based on ITE Land Use Codes (LUC) 222 – Multifamily Housing High-Rise (998 units), LUC 310 – Hotel (175 rooms), LUC 710 – General Office Building (1,158,000 square feet), and LUC 820 – Shopping Center (123,000 square feet). Accordingly, the Full-Build project would generate 27,963 unadjusted new trips on an average weekday, with 2,393 unadjusted new trips during the weekday morning peak hour, 2,911 unadjusted new trips during the weekday evening peak hour, and 2,103 unadjusted new trips during the Saturday midday peak hour.

These trips were adjusted for mode share given the availability of transit services under a future Build condition, as well as applied an internal capture of 15 percent to overall vehicle trips, a five percent carpool trip credit, and a four percent assumption for heavy trucks. A 60 percent non-vehicle mode share is desired by the project, and the mitigation program proposed is crafted with this goal in mind. Accordingly, the Full-Build project would generate 9,398 vehicle trips, 6,453 pedestrian trips, 6,152 transit trips, and 4,302 bicycle trips on an average weekday, with 805 vehicle trips, 552 pedestrian trips, 527 transit trips, and 368 bicycle trips during the weekday morning peak hour, 977 vehicle trips, 672 pedestrian trips, 640 transit trips, and 448 bicycle trips during the weekday evening peak hour, and 709 vehicle trips, 485 pedestrian trips, 463 transit trips, and 324 bicycle trips during the Saturday midday peak hour.

Safety

The TIA includes a summary of crash rates derived from the City of Somerville for the three-year period between August 2014 and August 2017. All but three of the study area intersections (the Webster Avenue/Tremont Street/Columbia Street, the Beacon Street/Concord Avenue, and the Beacon Street/Washington Street intersections) experience crash rates below the MassDOT statewide and District 4 averages. The FEIR should address the need for and appropriateness of mitigation measures to correct safety-related deficiencies based on consultation with MassDOT and the City of Somerville. DOT.1

There are several Highway Safety Improvement Program (HSIP)-eligible study area intersections and roadway segments, including:

- Somerville Avenue between Union Square and McGrath Highway;
- Washington Street between McGrath Highway and Somerville Avenue;
- Prospect Street between Webster Street and Somerville Avenue;
- Webster Avenue between Prospect Street and Somerville Avenue;

- McGrath Highway; and
- Bow Street.

These intersections have been the subject of projects to improve vehicular, pedestrian, and bicycle safety in recent years, including MassDOT Project #607981 (McGrath Boulevard Reconstruction). As such, we do not require that Road Safety Audits (RSAs) be conducted for these intersections.

The TIA notes that the transportation monitoring program for the project will identify safety-related deficiencies at study area intersections should they persist following the implementation of ongoing transportation infrastructure projects initiated by the City of Somerville within the study area.

Traffic Operations

Capacity analyses were conducted for the weekday morning, evening, and Saturday midday peak periods for existing, 2025 No-Build, and 2025 Build conditions. Several study area intersections are projected to operate at Levels of Service (LOS) E or F under both 2025 No-Build and 2025 Build conditions. The Washington Street/McGrath Highway intersection is projected to deteriorate from an LOS D to E under the Saturday midday peak hour.

Several study area intersections are the subject of ongoing and planned transportation infrastructure improvements, which aim to encourage multimodal travel throughout the project's study area. The TIA notes many of these projects aim to reduce vehicle speeds through physical traffic calming measures and intersection controls. Additionally, the City of Somerville's Union Square Neighborhood Plan includes an approach to mobility and transportation management which promotes pedestrian, bicycle, and transit travel over vehicle uses.

We are supportive of the Proponent's approach to a mitigation program primarily focused on alternative modes of transportation. This approach is consistent with the goals of MassDOT Project #607981 (McGrath Boulevard Reconstruction), which seeks to improve safety and encourage multimodal travel along the McGrath Highway corridor as a priority over improving vehicular operations. Additionally, the findings of the Lower Mystic Regional Working Group (LMRWG, of which the City of Somerville served as a member), which urge that improvements to transit, bicycle, and pedestrian options be implemented as development occurs, lessens the need for the Proponent to focus on vehicle-related mitigation to address project-related impacts.

Pedestrian Impacts

The TIA includes an evaluation of pedestrian activity and pedestrian infrastructure conditions at all study area intersections. A pedestrian level of service (PLOS) is provided for crosswalks within the study area, measuring pedestrian delay using a measurement of crosswalk length and vehicular traffic flow. Several crosswalks experience PLOS E or F under existing conditions across several peak periods. The PLOS analysis for the 2025 No-Build and Build conditions show similar conditions, although PLOS is not projected to substantially deteriorate

as a result of project-related impacts. A mitigation program of pedestrian improvements is proposed within the project site, including:

- A pedestrian plaza providing at-grade, Americans with Disabilities Act (ADA) access to the future Union Square MBTA Green Line station;
- Continuous, expanded sidewalks of a minimum width of 12-feet along blocks with building frontages on Somerville Avenue, Prospect Street, Washington Street, and Webster Avenue, supported by street furniture, plantings, a new urban tree canopy;
- A through-block pedestrian connection between the D6 parcel to provide an alternative path to the Union Square Plaza, across Prospect Street; and
- Improvement of a portion of Newton Street along the D4.3 parcel to provide a pedestrian-only civic space.

The Proponent cites the increase in traffic volume as the cause of PLOS deterioration between the 2025 No-Build and Build conditions and argues that the significant volume of pedestrians at unsignalized intersections compels motorists to yield as a matter of course.

The Proponent has committed to monitor pedestrian conditions at several study area intersections as part of the Mobility Management Plan with the City of Somerville. Improvements will be implemented at intersections identified as areas of focus to reduce pedestrian delay and improve pedestrian safety as pedestrian volumes grow.

Bicycle Impacts

The TIA includes an evaluation of bicycle activity and bicycle infrastructure conditions at all study area intersections. A Bicycle Level of Traffic Stress (LTS) analysis is provided for roadway segments within the study area, incorporating criteria such as street width, bike lane and parking lane width, prevailing traffic speed, and frequency of bike lane blockages. The analysis notes the anticipated improvement of LTS between existing conditions and the 2025 Build condition as a result of anticipated city-initiated improvements.

The Proponent has committed to providing approximately 1,750 bicycle spaces for short and long-term use across the project site, with 550 of these spaces adjacent to the Union Square MBTA Green Line station. The protected and secure bicycle parking facility will also be provided adjacent to the Union Square MBTA Green Line station providing 90 additional spaces. At least two bike share stations will be provided.

Bicycling conditions will be monitored as part of the Mobility Management Plan with the City of Somerville, with improvements such as signage as well as signal timing and phasing changes considered for future implementation.

Public Transportation

The TIA includes an evaluation of transit services within the study area, developed in coordination with MassDOT and the MBTA's Office of Performance Management & Innovation

(OPMI). The purpose of this coordination is to use new metrics to measure transit service capacity in compliance with standards established in the MBTA's 2017 Service Delivery Policy. Bus routes within the project's study area were queried to measure passenger comfort, reflected as the minutes of passenger time spent in crowded conditions on buses, as a result of additional trips generated by the project.

The MBTA's Comfort Metric sets a target of 96% of cumulative route performance to be experienced by passengers in comfortable conditions, with a maximum comfortable passenger-to-seat ratio for high-volume travel periods at 140%. The maximum comfortable passenger-to-seat ratio for low-volume travel periods is 125%. The analysis outlined in the TIA identified individual trips in which these load factors were exceeded at any point along the run. Under existing conditions several runs exceed the load factor, with two runs (the 5:40 PM Route 87 outbound run [to Clarendon Hill] and the 5:00 PM Route CT2 outbound run [to Sullivan]) exceeding load factors within the Union Square area. Under 2025 No-Build conditions (using a 0.25 percent compound growth rate), two additional runs exceed the load factor over Existing conditions, although neither of these exceedances occur within the Union Square area.

To estimate the impact of project-generated trips, the Proponent assigned transit trips to individual transit services (Green Line and the 85, 86, 87, 91, and CT2 bus routes) based on the origin/destination flow data used for the project's trip distribution analysis. Trips were assigned to half-hour segments over the course of a typical weekday using existing stop-level usage data for the fifteen bus stops within the study area provided by the MBTA. Boardings and alightings for these fifteen bus stops were also aggregated by route and direction. The result of this exercise is a distribution of project-related trips by time, and by boarding or alighting.

Project-generated trips were then assigned to each bus run in a proportional matter; for routes that come more often during a half hour, more trips were proportionally distributed to those routes. For both inbound and outbound runs, new trips were allocated evenly across runs in that half hour and added to load counts either arriving (for alightings) or leaving (for boardings) a study bus stop and also leaving upstream (for alightings) and downstream (for boardings) stops. Passengers were assumed to stay on board until the next rapid transit stop, or else the end of the run. The analysis is conservative in nature in defining impacts within the Union Square area by assuming that leaving passengers board at the first stop in the study area while arriving passengers disembark at the last stop in the study area (the area of overlap).

Several additional runs were found to exceed the load factor over 2025 No-Build conditions as a result of project-generated trips; of these runs, ten occur within the Union Square area, with the Proponent noting that at least five of these runs exceeding only at one stop within the area of overlap within the project area. Much of the impact is concentrated on MBTA Bus Route 86, which does not currently meet the MBTA Service Delivery Policy comfort metric, contains a higher ridership than other bus routes, and has a greater frequency and was thus assigned a proportionally higher number of project-generated trips.

The TIA notes that the analysis assumes full-build of the project even though the project will be built in phases over time, and that ongoing efforts of the MBTA, including the Better Bus

project, the impending bus network redesign effort, and potential modifications to bus routes once the Green Line opens will likely change the dynamics of bus services within the study area. The Proponent proposes no mitigation to offset the impacts identified in the TIA in light of these considerations.

While we acknowledge future changes to bus routes in the project area are possible, the Proponent should still address how to mitigate these current conditions and commit to an implementation plan that could be revisited as the project is built out over time. Improvements, such as the implementation of on-street improvements (i.e. queue jumps, transit signal priority, dedicated bus lanes) or technical or financial assistance to improve bus system operations will benefit bus route operations in a future condition regardless of whether route configurations change as a result of any future MBTA initiatives. The presence of a deficient condition in the existing and future condition is indicative of heavy demand placed on the route network; improvements implemented by the Proponent will likely complement any future improvements implemented by the MBTA, as a reduction in service levels would appear unlikely. DOT.2

The TIA notes ongoing initiatives within the study area to improve bus services, including the construction of a dedicated bus lane on Prospect Street. MassDOT's Expanded Environmental Notification Form (EENF) response letter made note of this potential improvement as well as the potential re-apportionment of parking areas along Prospect Street to extend the existing bus lane or create a second bus lane to improve bus service operations, which the City of Somerville and the MBTA Service Planning Department have previously indicated interest in implementing.

The FEIR should discuss how these and any other previously identified improvements to be implemented by the Proponent and/or the City of Somerville with regards to transit service will improve operations for deficient routes, as identified in the transit analysis carried out in the TIA. If previously identified improvements are not expected to adequately address this deficiency, the Proponent and/or the City of Somerville should seek new improvement options to offset project-related impacts. The FEIR should provide an update on these specific measures; the Proponent should consult with MassDOT and the MBTA Service Planning Department on this matter prior to the submission of the FEIR. DOT.3

Green Line Extension (GLX) Coordination

A Letter of Intent between the MassDOT GLX project team, US2 and the City of Somerville, agreed upon in August 2018, memorialized certain agreements between the parties with respect to design and construction scheduling coordination and the transfer of temporary and permanent easements for the MBTA's benefit related to the construction and operation of the future MBTA Union Square Green Line Station. As part of this agreement, the Proponent had agreed to construct various improvements for the Union Square Station, including operator facilities, vehicle pickup/drop-off areas, bicycle storage, and an accessible pathway between the station and Prospect Street.

The Proponent's ability to complete these improvements for the opening of GLX for revenue service scheduled for late April 2021 was contingent on the Proponent being conveyed title for Block D2 of the proposed development by February 28, 2019. Because the prerequisites to the conveyance of Block D2 were not achieved in accordance with the contemplated schedule, the schedules for the construction of the Union Square Station and the development project have diverged.

The MBTA GLX project team, US2, the Somerville Redevelopment Authority, and the City of Somerville are continuing to discuss schedule coordination and construction of the previously agreed-upon improvements, with scheduling assumptions requiring revision based on further development of the Proponent's project schedule. At this time an agreement has not been achieved, although the GLX project team feels some form of agreement is likely.

We raise the following comments on behalf of the GLX project team given the information contained in the TIA:

- No element of the project, including the location of Improvements proposed by US2, should preclude or otherwise impact: (a) a potential future Green Line connection to Porter Square; (b) the potential for moving the layover area further west; or (c) the potential to relocate the Union Square Station closer to the Prospect Street Bridge. DOT.4

- US2 should be required to deliver to the MBTA the agreed-upon improvements in locations and in a manner acceptable to the MBTA consistent with the Letter of Intent on a date that is consistent with the Proponent's schedule; DOT.5

- To the extent that the Proponent's schedule does not permit the MBTA to use one or more of the improvements on the date that revenue service begins at Union Square Station, accommodating time for each improvement to be tested for use by the MBTA, the Proponent will provide to the MBTA, at the Proponent's cost and expense, a temporary improvement reasonably acceptable to the MBTA so that the Proponent's schedule will have no impact on the opening of the Union Square Station and that will remain in place until the improvement as agreed to is operational; DOT.6

- We note that the proposed location of the accessible path as proposed in the Letter of Intent assumed that it would be in its final condition upon opening of the Union Square Station. To the extent that this objective cannot be achieved, the Proponent must demonstrate to the MBTA that comparable, legal and fully accessible access can be provided during any temporary conditions. Particular care must be taken with respect to the accessible path to the Station during construction so that safe, convenient and uninterrupted access is provided to the Station at all times; and DOT.7

We note that the Proponent should coordinate with the MBTA Service Planning Department regarding bus stop locations and improvements along parcel frontages, particularly with respect to the stop in the vicinity of the Union Square station. DOT.8

In addition to the above comments, we are concerned about the access being proposed from Prospect Street to the public plaza that will be a part of the project and that will be directly adjacent to the Union Square Station, separate and apart from the Proponent's commitment to a fully accessible path to the station. We understand that this plaza is proposed as a "civic space" under Somerville's zoning. The Proponent is proposing to provide two additional means of access to this civic space via two new staircases.

An elevator was proposed to the Union Square Station as part of the Proponent's Coordinated Development Special Permit application from November 2017 and as part of previous public outreach for the project, but is no longer proposed in this TIA. Equivalent access from the plaza to the Union Square Station for persons with disabilities may not be provided under this proposal.

The Proponent should revisit the access proposal it has made to this civic space. Our views are consistent with those provided by the Somerville Design Review Committee's (DRC) Design Review Checklist dated October 3, 2018 and we encourage the Proponent to consider the DRC's suggestions for improving access. DOT.9

The MBTA's systemwide accessibility staff has also reviewed the DEIR, and provides the following comments:

- The Proponent should consult with the GLX project team regarding access to the Union Square Station from the Prospect Street bridge. DOT.10
- Prior to the disposition of any land by the MBTA, a standard canvassing process should be completed through the MBTA as a part of the requirements of Chapter 40, Section 54A. DOT.11
- The design shows multiple pedestrian and vehicular paths to and from the station. We request that the Proponent provide to the MBTA with independent technical services to allow for the review of the design from an urban design perspective and, in particular, to review what could be several potential personal safety issues for the MBTA's customers. DOT.12

The FEIR should address the above concerns and update on its coordination efforts with the GLX team.

Parking

The project will include provision for 1,495 parking spaces. This figure was derived based on a parking demand model incorporating the Urban Land Institute's *Shared Parking Manual* (2nd edition) and ITE's *Parking Generation Manual* (4th edition), as well as factors such as the surrounding land uses of Union Square, the potential for shared uses by time of day, and the availability and desirability of using pedestrian, bicycle, and transit modes to travel to and within components of the project site. A comparison of the parking provision with projections using the ITE *Parking Generation Manual* (4th edition) find that the project provides significantly fewer parking spaces than projected.

The TIA notes that the following measures aimed at reducing the supply of and demand for parking on the project site:

- Shared parking arrangements will be sought where feasible given the mix of proposed project uses;
- Parking will be unbundled and sold separately from any lease or sale of another use within the development;
- Parking will be built in phases with the project, allowing the Proponent to monitor use and adjust management accordingly;
- Dedicated parking spaces will be limited;
- Access to car share services such as Zipcar and Enterprise will be provided on-site;
- Preferential parking will be provided for carpool vehicles, with use and demand monitored;
- Real-time availability will be provided for commercial service vehicular parking at parking structure or lot entrances;
- Use of market-rate pricing for residential and commercial uses; and
- Promotion of daily parking rate pricing rather than monthly leasing of parking spaces.

MassDOT applauds the Proponent for its comprehensive efforts to reduce parking and stay consistent with the spirit of the LMWRG recommendations, which aim to reduce vehicular traffic by limiting and efficiently managing the availability and utilization of parking spaces.

Transportation Demand Management (TDM)

The TIA includes a "Mobility Management Plan" which outlines a comprehensive TDM program for the project site. The Proponent will implement the following measures aimed at reducing site trip generation:

- Commitment to a 60% non-auto mode share, including an ongoing monitoring program in conjunction with the City;
- Assignment of an on-site TDM coordinator to oversee all TDM programs for each building;
- Assistance to site employees and residents with ride-matching and transportation planning;
- Dissemination of information on alternate modes of transportation and development of transportation-related marketing and education materials;
- Hosting of an annual mobility management educational meeting for tenants and their employees;
- Development and maintenance of information pertaining to pedestrian and bicycle access to and from the project site;
- Distribution of transit maps and passes;
- Requirement of tenant registration with an emergency ride home program (please note that the MassRIDES Emergency Ride Home will soon be disbanded and should not be considered by the Proponent);

- Consideration of the provision of free or discounted transit passes;
- Encouragement of employers to provide a certain level of transit pass and/or Bluebikes membership as an employee benefit;
- Exploration of a bulk purchase of transit passes and/or Bluebikes membership to new residential tenants;
- Encouragement of alternative hours and flexible work schedules for employers;
- Provision of secured, covered bicycle storage within each building;
- Provision of bicycle racks at locations near various buildings within the overall development;
- Provision of changing rooms, repair, and shower facilities for bicycle and pedestrian commuters;
- Provision of a shuttle service for proposed hotel uses traveling to and from major transportation hubs such as Logan Airport; and
- Promotional events for transit riders, bicyclists, and pedestrians.

Given the phased nature of the development, TDM measures will be expected to be implemented as different uses become active rather than at full occupancy of the site. The FEIR should clearly outline how the TDM program will be developed to align with the phasing program. DOT.13

As discussed in our EENF comment letter, the Proponent must join or include in its tenant's lease agreements specific requirements to join the MBTA Perq Program. DOT.14

We continue to encourage the Proponent to work toward identifying the details of these measures as well as developing additional programs. The Proponent should consult with MassDOT and the Assembly Square Transportation Management Association (TMA), to help implement the TDM program. The TIA also notes the Proponent will participate in exploring the formation of a Union Square TMA as the area develops. DOT.15

Transportation Monitoring Program

The Proponent will be required to conduct an annual transportation monitoring program for the project. Given the build out of the project is expected to occur in phases over time and additional mitigation may be determined as a result, the Proponent should consult with MassDOT and the City of Somerville on the details of when and what need to be included in the report. At a minimum, it should include: DOT.16

- Simultaneous automatic traffic recorder (ATR) counts at each site driveway for a continuous 24-hour period on a typical weekday;
- Travel survey of employees and patrons at the site (to be administered by the transportation coordinator);
- Updates on the TDM plan implementation;
- Bicycle usage;
- Weekday AM and PM turning movement counts (TMCs) and operations analysis at several intersections within the study area;

- Crash data and analysis for the HSIP locations identified in this letter;
- Pedestrian counts at the above locations, and
- Transit (bus and train) ridership counts.

The goals of the monitoring program will be to evaluate the assumptions made in the EIRs and the adequacy of the mitigation measures, as well as to determine the effectiveness of the TDM program. The Proponent has committed to conducting counts of bike parking occupancy and consider the following measures should mode split goals not show sufficient progress:

- Increasing prices for high-demand parking spaces;
- Provision of on-site amenities to reduce daytime trips by automobile; and
- Provision of peak hour employee shuttle service to the Sullivan Square and Central Square MBTA stations.

We note that the provision of an employee shuttle service will likely be redundant of existing and future MBTA bus services and create more congestion in the project area. We strongly encourage the Proponent to coordinate with the MBTA to improve service frequencies for bus routes accessing Sullivan Square or stations along the Red Line (such as Davis Square, Porter Square, and Harvard Square). The Proponent should speak more to this proposal in the FEIR. DOT.17

Given the phased nature of the development, the travel survey component of the monitoring program, which should include solicitation of multimodal mode shares to the project site, should commence following completion of the first phase of development. The phasing program should be clearly defined as part of the Transportation Monitoring Program and discussed in the FEIR. DOT.18

The Proponent should continue consultation with appropriate MassDOT units, including PPDU, Traffic Operations, and the District 4 Office, as well as the MBTA Service Planning Department. More specifically, the Proponent should work closely with the GLX construction team to ensure appropriate design and construction coordination of the site development and the GLX construction. If you have any questions regarding these comments, please contact me at (857) 368-8862 or Michael Clark at (857) 368-8867. DOT.19

DOT.1 **Address the need for and appropriateness of mitigation measures to correct safety-related deficiencies based on consultation with MassDOT and the City of Somerville.**

As described in Section 2.2, the TIA included in the DEIR indicated that all but three of the study area intersections experience crash rates below the MassDOT statewide and District 4 averages. The three intersections that were identified as having crash rates above the MassDOT statewide and District 4 averages for the three-year period between August 2014 and August 2017 are:

- Webster Avenue / Tremont Street / Columbia Street;
- Beacon Street / Concord Avenue; and
- Beacon Street / Washington Street.

While the intersections listed are in the Project's expanded study area, it should be noted that none are proximate to any of the Blocks comprising the Project, and all see minimal change in operations due to Project-related impacts. Moreover, US2 has met with the City to review each of these locations, and the City is already engaged in planning and design for safety (and other) improvements at each of these locations, including engaging with MassDOT for each as indicated. This approach was confirmed with MassDOT at a meeting on April 17, 2019. Please see Section 2.2 for additional details.

DOT.2 **Address how to mitigate the current bus conditions and commit to an implementation plan that could be revisited as the project is built out over time.**

US2 has coordinated with the City to identify potential changes to the bus system that should be evaluated, including:

- Maximizing connections to Sullivan Square;
- Maximizing connections to MBTA Red Line stations, primarily at Kendall, Central, and Harvard stations; and
- Minimizing duplication with Green Line service when open, which could be accomplished by:
    - Considering the elimination of Route 80 which parallels the College Avenue Green Line extension, or terminate at one of the Green Line stations before Lechmere;
    - Considering termination of Route 87 at Union Square, rather than Lechmere; and,

- Considering termination of Route 88 at Union Square or Washington Street, rather than Lechmere.

Changes to existing routes should occur in conjunction with or following the initiation of Green Line service. The additional service time saved by these changes should be re-invested in local services as determined to relieve overcrowding, increase frequency or provide additional connections in and around the Union Square area. Please see Section 2.5 for more information.

To fund these potential improvements, the City will allocate a portion of the Proponent's committed offsite infrastructure and future phase contribution monies to rapid-response, short-term mobility and safety retrofits in the Project area.

DOT.3 **Discuss how ongoing initiatives within the study area to improve bus services and any other previously identified improvements to be implemented by the Proponent and/or the City of Somerville with regards to transit service will improve operations for deficient routes, as identified in the transit analysis carried out in the TIA. If previously identified improvements are not expected to adequately address this deficiency, the Proponent and/or the City of Somerville should seek new improvement options to offset project-related impacts. Provide an update on these specific measures; the Proponent should consult with MassDOT and the MBTA Service Planning Department on this matter prior to the submission of the FEIR.**

Please see the response to DOT.2. The Proponent consulted with MassDOT and the MBTA Service Planning Department regarding transit service in the Union Square area.

DOT.4 **No element of the project, including the location of Improvements proposed by US2, should preclude or otherwise impact: (a) a potential future Green Line connection to Porter Square; (b) the potential for moving the layover area further west; or (c) the potential to relocate the Union Square Station closer to the Prospect Street Bridge.**

US2 has committed to convey a permanent easement to the MBTA across the portion of D2 that includes the station area so the MBTA can construct, operate, maintain, repair and replace the GLX (see Figure 1-3). US2 will purchase the entire D2 Block from the SRA, but will provide the easement at no cost to the MBTA. US2's Project does not include any improvements within the permanent easement that would preclude or otherwise impact: (a) a potential future Green Line connection to Porter Square; (b) the potential for moving the layover area further west; or (c) the potential to relocate the Union Square Station closer to the Prospect Street Bridge.

DOT.5 **US2 should be required to deliver to the MBTA the agreed-upon improvements in locations and in a manner acceptable to the MBTA consistent with the Letter of Intent on a date that is consistent with the Proponent's schedule.**

US2 and the MBTA are parties to a Letter of Intent that details their commitments regarding matters related to coordination and development of the station and the portions of the Project adjacent to the new MBTA station, including delivery of certain improvements by US2. US2 has committed to deliver the MBTA agreed-upon improvements in locations and in a manner that are mutually agreeable to the parties, consistent with the terms of the Letter of Intent, and delivered in accordance with US2's schedule for the development of D2 (as may be amended from time to time based on events outside of US2's control). The locations for the improvements, based on the latest coordination between the parties, are depicted on Figure 1-21. Please see Section 1.3 for additional information regarding coordination with the GLX project.

DOT.6 **To the extent that the Proponent's schedule does not permit the MBTA to use one or more of the improvements on the date that revenue service begins at Union Square Station, accommodating time for each improvement to be tested for use by the MBTA, the Proponent will provide to the MBTA, at the Proponent's cost and expense, a temporary improvement reasonably acceptable to the MBTA so that the Proponent's schedule will have no impact on the opening of the Union Square Station and that will remain in place until the improvement as agreed to is operational.**

As noted by the MBTA in the DEIR comment letter, the commitment to deliver the improvements on the timeline contemplated in the Letter of Intent was contingent upon US2's closing on the D2 property by February 2019. The closing required certain preconditions including the receipt of a MEPA Certificate and therefore, was not accomplished in the timeframe noted. As a consequence of the delays in the closing on the D2 property, the schedules for the construction of the Union Square Station and the D2 development have diverged. If the schedule divergence remains as both projects evolve and proceed with design and construction, US2 agrees to continue its work with the MBTA to identify temporary solutions for the improvements and to collaborate with the MBTA for the provision of said temporary improvements. As noted above, US2 has made several new commitments, since the DEIR was filed, that are intended to provide further benefits to the MBTA and the GLX project, including commitments related to a MBTA elevator to serve the station and improve access.

Provided that both parties can substantially maintain their current construction schedules, US2 has also agreed to provide permanent or temporary solutions for the ADA-compliant access across the future D2 plaza, bike storage and The Ride drop-off on time for the planned start of Union Square Station revenue service. US2 will also provide D2 land area on an interim basis for the MBTA's provision of a temporary employee breakroom until the permanent solution is completed.

DOT.7 **We note that the proposed location of the accessible path as proposed in the Letter of Intent assumed that it would be in its final condition upon opening of the Union Square Station. To the extent that this objective cannot be achieved, the Proponent must demonstrate to the MBTA that comparable, legal and fully accessible access can be provided during any temporary conditions. Particular care must be taken with respect to the accessible path to the Station during construction so that safe, convenient and uninterrupted access is provided to the Station at all times.**

As noted by the MBTA in the DEIR comment letter, the timing of the delivery of the accessible path as contemplated in the Letter of Intent was contingent upon US2's closing on the D2 Property by February 2019. The closing required certain preconditions including the receipt of a MEPA Certificate and therefore, was not accomplished in the time noted. As a consequence, the schedules for the construction of the Union Square Station and the D2 development have diverged. If the schedule divergence remains as both projects evolve, US2 will work with its contractor and the MBTA to provide a temporary accessible path across the future D2 plaza area until the permanent solution is completed. The temporary accessible path will likely run along the western edge of the D2 property and will run parallel and adjacent to the Prospect Street bridge abutment. The final solution remains subject to coordination between US2, their contractor and the MBTA as the two projects evolve. As noted above, US2 has also made several new commitments, since the DEIR was filed, that are intended to provide further benefits to the MBTA and the GLX project, including commitments related to a MBTA elevator to serve the station and improve access.

DOT.8 **We note that the Proponent should coordinate with the MBTA Service Planning Department regarding bus stop locations and improvements along parcel frontages, particularly with respect to the stop in the vicinity of the Union Square station.**

US2 will coordinate with the MBTA Service Planning Department and the City regarding bus stop locations and improvements along Block frontages, including with respect to the stop in the vicinity of Union Square Station.

Additional information was requested in the DEIR Certificate about coordination with the MBTA Service Planning Department regarding bus stop locations and improvements along Block frontages, particularly with respect to the stop in the vicinity of the future Union Square Station. As a condition of its master plan approval, US2 committed to improving the accessibility and comfort of existing bus stops that are located on Project Lot frontages (i.e., six existing bus stops located on Lots D1.2, D2.1, D3.1, D4.3, D6.2 and D7.2).

As plans are submitted for each Lot, US2 will work with the City and the MBTA on the location, potential improvement and design of bus stops per the then current MBTA plans and City and MBTA design guidelines. The proposed improvements will be part of the

Transportation Access Plan and Mobility Management Plan for each Lot. This process is underway for the bus stop on Prospect Street proximate to Lots D2.1, D2.2, and nearby the future Union Square Station.

DOT.9 **The Proponent should revisit the access proposal it has made to this civic space. Our views are consistent with those provided by the Somerville Design Review Committee's (DRC) Design Review Checklist dated October 3, 2018 and we encourage the Proponent to consider the DRC's suggestions for improving access.**

US2 received the DRC's comments related to access to the D2 civic open space and has revised the civic open space design in response. The D2 civic open space design was revised to provide a more definitive circulation route along its length and to create unique pockets for activity or relaxation. The MBTA bike storage cage was relocated away from the entry of the station in order to eliminate pedestrian and cyclist conflicts at the station entry. Additional study was performed on paths of travel of the various modes of transport to and from the station, and design refinements were made to enhance access for pedestrians, cyclists and vehicles (including The Ride). The southern end of the civic open space plaza was redesigned to create more of an outdoor room and includes an amphitheatre-like seating wall that could provide a place to meet, to wait for a train or to watch a performance. US2 also studied the approach from the south to the MBTA station and noted that a large portion of the MBTA service area arrives from the south of the station. US2 is coordinating with the MBTA, the City and GLX project team to identify a solution for providing vertical circulation from the Union Square Station to the Prospect Street bridge for MBTA patrons. Additional details regarding the D2 plaza is included in Section 1.2.4.4, and additional details regarding coordination with the GLX project are discussed in Section 1.3.

DOT.10 **The Proponent should consult with the GLX project team regarding access to the Union Square Station from the Prospect Street bridge.**

US2 is continuing its consultation with the MBTA, City and the GLX project team regarding access to Union Square Station from the Prospect Street bridge for MBTA patrons. This is particularly important for the station service area to the south of the station that includes portions of Somerville and Cambridge as described in Section 1.3. In order to contribute to improving circulation from the station to the Prospect Street bridge, US2 has offered to amend the D2 design to provide, at no cost to the MBTA, easement rights on the D2 property as required to make way for the MBTA elevator and/or to install a stair adjacent to the MBTA elevator location. US2 has also offered to contribute to the cost of the MBTA elevator's installation. US2 will continue to coordinate with the MBTA, the City and other stakeholders on this issue and remains hopeful that a solution for the MBTA elevator can be identified.

DOT.11 **Prior to the disposition of any land by the MBTA, a standard canvassing process should be completed through the MBTA as a part of the requirements of Chapter 40, Section 54A.**

US2 has been in regular contact with the MBTA and MassDOT and their counsel, including in connection with discussions over design and construction coordination and the need for the completion of the Chapter 40, Section 54A process. Because the Project includes proposed construction of structures on lands formerly used as a railroad right-of-way, US2 will need to cause the submission to MassDOT of a Chapter 40 Section 54A application, which application will need to be addressed to MassDOT from the building inspector of the City of Somerville. Once the completed application has been submitted to MassDOT, MassDOT will undertake a review of the application, including a standard canvassing process through which review of the application by other interested public agencies will be solicited by the applicable persons within MassDOT. After completion of this standard canvassing process, MassDOT and any other applicable interested public agency will review the application and MassDOT will contact the applicant to schedule and advertise a public hearing respecting the Chapter 40 Section 54A application. Upon completion of the public hearing and of MassDOT's review of public comments resulting from the public hearing, if any, MassDOT will typically send a letter to the applicant issuing the Secretary's decision to the building inspector and the applicant. US2 will consult with MassDOT regarding the process to acquire the approval under Chapter 40, Section 54A, as presented in Section 1.5.2.2.

DOT.12 **The design shows multiple pedestrian and vehicular paths to and from the station. We request that the Proponent provide to the MBTA with independent technical services to allow for the review of the design from an urban design perspective and, in particular, to review what could be several potential personal safety issues for the MBTA's customers.**

As a continuation of the ongoing coordination process described in Section 1.3 and as requested in the comment letter, US2 recently provided an overview of the latest D2 designs to the MBTA for their review from an urban design and transit user safety perspective. US2 has also offered to organize a meeting with US2's design team and MBTA representatives to discuss specific questions or concerns related to the urban design and transit user safety. Said meeting is currently being scheduled. US2 will continue to coordinate with the MBTA and GLX project team on a successful design integration of the D2 development and Union Square Station.

DOT.13 **Outline how the TDM program will be developed to align with the phasing program.**

As described in Section 4.7 of the DEIR, the Project will complete individual mobility management plans for each Lot as part of the DSPR permitting process, rather than by phase. The Mobility Management Plan programs and policies will generally be consistent across all Lots, as well as the Project as a whole. A monitoring program will be established

allowing for ongoing review of consistency with the goals, and steps to achieve the 60% non-auto mode share through improvements in non-auto travel or program adjustments as needed to meet ongoing goals.

As there will be multiple tenants located within the Project site and within each Lot, Mobility Management Plan obligations will be included to the extent possible as part of the lease language between tenants and the property owner. Verification of the ongoing conformance with this condition will be provided to the City by the property owner either as a copy of the leases (with financial aspects and other non-Mobility Management Plan elements redacted) or via an affidavit signed by the owner and tenant(s) verifying that this language was included and agreed to in the lease. This documentation will be provided to the City prior to the issuance of the Certificate of Occupancy for tenant spaces with 50 or more employees. The proposed programs and services have been developed in service of the standards set forth in Union Square Zoning as adopted June 2017, and in response to the City's requirements from the CDSP, as well as comments received on the ENF.

The Project team will work with the City and/or future owners, employers and tenants to implement the measures outlined in the Mobility Management Plans. These programs and services may be refined from time to time to improve program efficiency or performance.

As described in Section 4.5.8.3 of the DEIR, based on the findings from the Annual Travel Survey and the most recent set of biennial counts, building management will submit a Mobility Status Report annually to the City. Depending on progress toward meeting the stated mode split goal and as evidenced by annual reporting, additional programs and services may be considered.

DOT.14 **The Proponent must join or include in its tenant's lease agreements specific requirements to join the MBTA Perq Program.**

US2 has joined the MBTA Perq Program. MBTA Perq is a program for companies and employees to encourage the use of MBTA services. Enrollees receive tax-advantaged MBTA transit benefits, including savings on payroll taxes and reduced transit costs. In addition, US2 agrees that as part of its leases to companies greater than 50 employees, US2 shall require the lessee to participate in the MBTA Perq program (or propose some equivalent substitute) as part of the lessee's transportation demand management obligation so long as MBTA Perq continues to exist and without substantial changes.

DOT.15 **The Proponent should consult with MassDOT and the Assembly Square Transportation Management Association (TMA), to help implement the TDM program.**

On March 25, 2019, US2 spoke with representatives from the Assembly Row TMA and learned about their ongoing efforts to create the Assembly Row TMA and provide TMA services for the Assembly Row district. The parties agreed to connect again later this year after construction has started on the Project to continue the dialogue. The goal of this coordination will be to share best practices, discuss challenges and identify synergies. US2 will continue to consult with MassDOT and the Assembly Square TMA as it implements the Union Square TDM Program.

DOT.16 **The Proponent will be required to conduct an annual transportation monitoring program for the project. Given the build out of the project is expected to occur in phases over time and additional mitigation may be determined as a result, the Proponent should consult with MassDOT and the City of Somerville on the details of when and what needs to be included in the report.**

As a component of the overall Mobility Management Plan for each Lot, the Project will complete traffic monitoring (as described in Section 2.7) and provide the City with a Mobility Status Update. The Project will work with the City, MBTA and MassDOT to coordinate the traffic monitoring program with other ongoing data collection efforts to maximize the ability to determine the need and plan for modifications as appropriate.

DOT.17 **We strongly encourage the Proponent to coordinate with the MBTA to improve service frequencies for bus routes accessing Sullivan Square or stations along the Red Line (such as Davis Square, Porter Square, and Harvard Square). The Proponent should speak more to this proposal in the FEIR.**

As noted in the response to DOT.2, US2 will continue to work proactively with the City and the MBTA and participate in ongoing processes to ensure that potential improvements to MBTA service in the Union Square area are strongly considered. The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts. The City has both the ability and the willingness to attempt additional interventions to benefit transit. The City may use the overall transportation mitigation and investment dollars provided per US2's development agreement to implement roadway changes. In addition, through the individual plans for each Lot, US2 will work with the City on potential transit improvements proximate to each Lot. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger operations within Union Square, and will be used to help determine future improvements or the success of ones previously implemented.

Changes to existing routes should occur in conjunction with or following the initiation of Green Line service. The additional service time saved by these changes should be re-invested in local services as determined to relieve overcrowding, increase frequency or provide additional connections in and around the Union Square area. Section 2.5 provides

specific transportation metrics that would suggest when modifications to the transportation system could be implemented to improve the MBTA's bus network, and what those modifications could be, including connections to the MBTA Red Line stations.

DOT.18 **Given the phased nature of the development, the travel survey component of the monitoring program, which should include solicitation of multimodal mode shares to the project site, should commence following completion of the first phase of development. The phasing program should be clearly defined as part of the Transportation Monitoring Program and discussed in the FEIR.**

US2 commits to initiating the travel survey component of the annual monitoring program following the completion of the first phase of development. The phasing of mitigation, including transportation mitigation, is described in Section 1.2.3.1 and Table A in Chapter 5.

DOT.19 **The Proponent should continue consultation with appropriate MassDOT units, including PPDU, Traffic Operations, and the District 4 Office, as well as the MBTA Service Planning Department. More specifically, the Proponent should work closely with the GLX construction team to ensure appropriate design and construction coordination of the site development and the GLX construction.**

US2 has continued to consult with MassDOT, the MBTA and other divisions as appropriate, directed and described above.

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

March 1, 2019

Secretary Matthew A. Beaton
Executive Office of Energy and Environmental Affairs
100 Cambridge Street
Boston, MA 02114

ATTN: Alex Strysky, MEPA Office

RE: Union Square Redevelopment, Somerville, MA; MHC# RC.53031; EEA# 15889

Dear Secretary Beaton:

Staff of the Massachusetts Historical Commission (MHC) have received the Draft Environmental Impact Report (DEIR) submitted for the above referenced project. After review of the information submitted, MHC staff have the following comments.

The project site includes approximately 15.7 acres within the Union Square neighborhood of Somerville. The site is made up of seven development blocks or portions of blocks known as the "D Parcels" which were designated for redevelopment in the Union Square Revitalization Plan.

The MHC understands that the U.S. Post Office, located at 237 Washington Street and is individually listed in the State and National Registers of Historic Places, is no longer proposed to be included in the Project. The DEIR states that the U.S. Post Office has been purchased by another qualified party so the Proponent does not currently intend to acquire and redevelop the U.S. Post Office.

The "D Parcels" are in close proximity to a number of historic districts and buildings. The historic districts in close proximity include, but are not limited to, the Bow Street Historic District, the Columbus Avenue-Warren Avenue Historic District, the Everett Street Local Historic District, the William Walker House, the William Bonner House, the John Smith House, 18 Sanborn Avenue, the Somerville Journal Building, the J.H. House Clark House, and the U.S. Post Office.

After review of MHC's files and the information submitted, MHC has determined that the proposed project will have "no adverse effect" (950 CMR 71.07(2)(b)(2)) on the resources listed above.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966 (36 CFR 800), M.G.L. Chapter 9; sections 26-27C (950 CMR 71.00), and MEPA (301 CMR 11). Please do not hesitate to contact Elizabeth Sherva of my staff if you have any questions.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
Massachusetts Historical Commission

xc: Somerville Redevelopment Authority
Union Square RELP Master Developer LLC
MassDOT
MassDEP
Katherine Ronan, MWRA
Geoff Starsiak, Epsilon Associates
Somerville Historical Commission

220 Morrissey Boulevard, Boston, Massachusetts 02125
(617) 727-8470 • Fax: (617) 727-5128
www.sec.state.ma.us/mhc

MASSACHUSETTS HISTORICAL COMMISSION

No comments to respond to.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

March 1, 2019

Matthew A. Beaton, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge St, Suite 900
Attn: MEPA Office, Alex Strysky
Boston, MA 02114

Subject: EOEEA #15889 – Draft Environmental Impact Report
Union Square Redevelopment, Somerville, MA

Dear Secretary Beaton,

The Massachusetts Water Resources Authority (MWRA) appreciates the opportunity to comment on the Draft Environmental Impact Report (DEIR) submitted by Union Square RELP Master Developer LLC and Somerville Redevelopment Authority (together, the "Proponent") for Union Square Redevelopment (the "Project") in Somerville, Massachusetts. MWRA submitted comments on the Expanded Environmental Notification Form (EENF) for the Project on August 24, 2018 and has reviewed the Secretary's Certificate, dated August 31, 2018. MWRA's comments on the DEIR continue to relate to wastewater issues and the need for Infiltration/Inflow (I/I) Removal, Discharge Permitting from the Toxic Reduction and Control (TRAC) Department and MWRA Enabling Statute Section 8(m) Permitting.

Wastewater

The DEIR reports that the total average day wastewater generated by the Project is estimated to be approximately 140,585 gallons per day (gpd), which the Proponent reports is a wastewater flow reduction of 1,832 gpd from the previously reviewed Project flow of 142,417 gpd. MWRA's comment letter on the Project EENF stated 1) the need to ensure that the Project's wastewater flow does not increase sewer surcharging and overflows in large storms and does not compromise the environmental benefits of MWRA's recently completed $910 million CSO control plan including its water quality benefits for the Mystic and Charles rivers, and 2) that the Proponent should fully mitigate the Project's potential wastewater flow impacts with infiltration/inflow (I/I) or stormwater removal in compliance with Massachusetts Department of Environmental Protection (MassDEP) regulation and in accordance with City of Somerville I/I policy. MWRA also requested to be informed of plans to meet the City's 4:1 I/I mitigation requirement for Phase 1 occupancy and that the Proponent describe in the DEIR how I/I mitigation requirements for each and all phases of the Project will be satisfied.

Section 10.1.3 of the DEIR states that the City of Somerville is addressing I/I mitigation with a three-part coordinated program consisting of: 1) the Somerville Avenue Utility and Streetscape Improvements project, 2) the City's proposed stormwater connection to the MBTA's drainage system that will serve the Green Line Extension project, and 3) a sewer separation project in the Spring Hill area. Private investment in the area was critical to funding these initiatives and the City obtain a $16 million MassWorks infrastructure grant for the ongoing sewer separation and stormwater removal projects. The Proponent has committed to an estimated $4.7 million for offsite infrastructure improvement and will contribute an estimated $3.5 million in inflow and infiltration fees.

The City's $63 million Somerville Avenue Utility and Streetscape Improvements project is currently under construction and includes a box culvert that will provide 800,000 gallons of stormwater storage to mitigate neighborhood flooding. The project represents a significant investment for the long-term goal of separating combined sewers throughout the City as it will ultimately provide for removal of stormwater from the sewer system and conveyance of the separated stormwater to the MBTA drainage system. Until the pumping station is operational, the storage in the box culvert will provide some sewer separation as well as in-system storage of stormwater that will help to reduce combined sewer overflows at MWRA's Prison Point CSO treatment facility. MWRA and the City of Somerville will continue to hold discussions and coordination as the City moves forward with these important and beneficial infrastructure improvements.

In addition to the sewer separation, the City is also completing a manhole sealing program that will reduce infiltration by an estimated 120,000 gpd. The DEIR states that the City is currently conducting pipeline investigations to identify additional infiltration reduction opportunities. The DEIR also states that the City has formally adopted an I/I ordinance that requires 4:1 offsets for any increase in wastewater flow. The Proponent will comply with the City of Somerville's I/I mitigation requirements, which may include financial contributions and/or private mitigation projects identified by the City that will remove I/I from its combined sewer system in an amount equal to at least four times the daily sanitary sewage generation. The Proponent will work closely with the City to ensure that the I/I mitigation is completed.

TRAC Discharge Permitting

Pursuant to 360 C.M.R. 10.091-10.094, a Temporary Construction Dewatering Permit is required prior to the discharge of groundwater from any construction sites associated with the Project into the sanitary sewer system. For assistance in in obtaining a permit, both the Proponent and the Contractor should contact Stephen Buczko, Industrial Coordinator in the TRAC Department at 1 (617) 305-5619. MWRA.1

An MWRA Sewer Use Discharge Permit is required prior to the discharge of laundry effluent from any hotel operations associated with the Project into the MWRA sanitary sewer MWRA.2

system. A Sewer Use Discharge Permit is also required prior to the discharge of any laboratory wastewater, and/or photoprocessing wastewater from laboratory space associated with the Project into the sanitary sewer system. For assistance in obtaining these permits, the Proponent should contact Stephen Buczko, Industrial Coordinator, in the TRAC Department at 1 (617) 305-5619.

Any gas/oil separators installed in parking garages associated with the Project must comply with 360 C.M.R. 10.016, and the regulations of the Board of State Examiners of Plumbers and Gas Fitters, 248 C.M.R. 2.00 (State Plumbing Code). The installation of gas/oil separators may not be back filled until inspected and approved by MWRA and the local plumbing inspector. For assistance in obtaining an inspection the Proponent should contact John Feeney, Source Coordinator in the TRAC Department at 1 (617) 305-5631. MWRA.3

Section 8(m) Permitting

Section 8(m) of Chapter 372 of the Acts of 1984, MWRA's Enabling Legislation, allows the MWRA to issue permits to build, construct, excavate, or cross within or near an easement or other property interest held by the MWRA, with the goal of protecting Authority-owned infrastructure. Due to the proximity of MWRA infrastructure, an 8(m) permit(s) may be required for the Project. The Proponent should coordinate with Ralph Francesconi in the MWRA Water and Wastewater Permitting Group at 1 (617) 305-5827 for assistance related to this matter. MWRA.4

On behalf of the MWRA, thank you for the opportunity to provide comments on this Project. Please do not hesitate to contact me at 1 (617) 788-4958 with any questions or concerns.

Sincerely,

Bethany Card
Director
Environmental and Regulatory Affairs

cc: Holly Johnson, DEP
John Viola, DEP
David Kubiak, MWRA
Kattia Thomas, MWRA
Kevin McKenna, MWRA
Rob King, City of Somerville

MWRA.1 **Pursuant to 360 C.M.R. 10.091-10.094, a Temporary Construction Dewatering Permit is required prior to the discharge of groundwater from any construction sites associated with the Project into the sanitary sewer system.**

If and when necessary, a Temporary Construction Dewatering Permit will be coordinated and obtained from the MWRA for the discharge of groundwater from any construction site into the sanitary sewer system. Each Lot will be evaluated individually and will be addressed during the permitting for that Lot.

MWRA.2 **An MWRA Sewer Use Discharge Permit is required prior to the discharge of laundry effluent from any hotel operations associated with the Project into the MWRA sanitary sewer system. A Sewer Use Discharge Permit is also required prior to the discharge of any laboratory wastewater, and/or photoprocessing wastewater from laboratory space associated with the Project into the sanitary sewer system.**

If and when necessary, an MWRA Sewer Use Discharge Permit will be coordinated and obtained from the MWRA for the discharge of wastewater from any laundry operations or laboratory wastewater into the MWRA sanitary sewer system. Each Lot will be evaluated individually and will be addressed during the permitting for that Lot.

MWRA.3 **Any gas/oil separators installed in parking garages associated with the Project must comply with 360 C.M.R. 10.016, and the regulations of the Board of State Examiners of Plumbers and Gas Fitters, 248 C.M.R. 2.00 (State Plumbing Code). The installation of gas/oil separators may not be back filled until inspected and approved by MWRA and the local plumbing inspector.**

All gas/oil separators installed in parking garages will be designed to comply with 360 CMR 10.016, the regulations of the Board of State Examiners of Plumbers and Gas Fitters, and the regulations of the State Plumbing Code. Prior to any backfill of these structures, appropriate inspections will be coordinated with MWRA and the local plumbing inspector as necessary.

MWRA.4 **Due to the proximity of MWRA infrastructure, an 8(m) permit(s) may be required for the Project.**

If and when necessary, an MWRA 8(m) Permit will be coordinated and obtained from the MWRA Water and Wastewater Permitting group for the construction, excavation, or crossing within or near property interest held by the MWRA. Each Lot will be evaluated individually and will be addressed as part of the permitting process for that Lot.

February 25, 2019

Matthew A. Beaton, Secretary
Executive Office of Energy & Environmental Affairs
Attention: MEPA Office – Alex Strysky, MEPA #15889
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: Union Square Redevelopment, MEPA #15889, Draft Environmental Impact Report

Dear Secretary Beaton:

The Metropolitan Area Planning Council (MAPC) regularly reviews proposals deemed to have regional impacts. The Council reviews proposed Projects for consistency with *MetroFuture*, the regional policy plan for the Boston metropolitan area, the Commonwealth's Sustainable Development Principles, consistency with Complete Streets policies and design approaches, consistency with the requirements of the Global Warming Solutions Act (GWSA), as well as impacts on the environment.

The Union Square Redevelopment (the Project) is a mixed-use and transit-oriented development of approximately 2.4 million square feet (sf) in 7 development parcels, referred to as the "D Blocks." Union Square RELP Master Developer LLC (US2) and the Somerville Redevelopment Authority (SRA) (jointly, the Proponent) propose to redevelop approximately 15.1 acres in the Union Square neighborhood of Somerville. The only material Project change since the Environmental Notification Form (ENF) is that the former Post Office Building is no longer proposed to be included in the Project.

The development program includes 1.15 million sf of office/lab space, 123,000 sf of retail space, a 93,000-sf hotel (175 rooms), 54,000 sf of arts/creative space, and 933,000 sf of residential units (up to 998), including 200 of these designated as permanently affordable. This Project will help to advance equity in the region, in addition to creating strong links between transit, jobs, and homes. When complete, the Project will include a maximum of 1,495 parking spaces and is forecast to generate 9,397 average daily trips[1]. It is anticipated that the entire Project will be constructed in three phases.

This Project is the product of an extensive public process spanning nearly a decade and reflects the City's ongoing partnership with the MBTA in support of the Green Line Extension project (GLX).

The Project is within walking distance of multiple MBTA bus routes and will be adjacent to the MBTA's GLX project once it is completed. As a high density mixed-use development, this Project has the potential to advance several of the region's transportation goals, as enunciated in MetroFuture. It also has the potential to advance the Commonwealth's statutory obligation to meet the GHG reductions of the GWSA — 25% from 1990 levels by 2020 and by 80% from 1990 levels by 2050.

[1] 9,397 average daily trips are adjusted. Unadjusted daily trips are 22,352.

The following recommendations are intended to help this Project to reach its full potential. Specifically, MAPC's recommendations include providing cost estimates for proposed mitigation and ensuring a better bus line interface with the Green Line.

MAPC respectfully requests that you require the Proponent to address our comments in the Final Environmental Impact Report (FEIR) and the forthcoming Section 61 Findings.

Thank you for the opportunity to comment on this Project.

Sincerely,

Eric Bourassa
Transportation Director

cc: Mayor Joseph A. Curtatone, City of Somerville
George Proakis, City of Somerville
Brad Rawson, City of Somerville
David Mohler, MassDOT

Mitigation

MAPC recognizes that the Proponent has made significant investments towards the GLX (both direct monetary and in-kind facility contributions) and the Somerville Avenue Utility and Streetscape Improvements project. MAPC supports these investments but would like to comment that they could be summarized more clearly and succinctly. The DEIR does not provide a defined mitigation program with cost estimates. In particular this is exemplified in Table A, Summary of Impacts and Mitigation Measures, of the Draft Section 61 Findings.

It is important to underscore that the request for the Proponent to provide a defined mitigation program with cost estimates was made more than once in the Secretary's EENF Certificate:

The DEIR should more fully document the design, impacts and mitigation measures associated with the first phase of the project and its close coordination with, and support of, City and State-sponsored infrastructure projects. (page 2) and

The Proponent should indicate a clear commitment to implement proposed mitigation measures and describe the timing of their implementation, including whether measures are implemented based on phases of the project or occupancy levels. The DEIR should identify projects that have or will be completed by the City that will affect transportation conditions. It should identify all mitigation measures, including TDM, roadway mitigation and pedestrian, bicycle and transit improvements, and outline a transportation monitoring program. (pages 26-27)

The Proponent needs to continue collaborating with the City to clearly designate financial commitments for specific programs or projects. MAPC respectfully requests that the Proponent's FEIR include a clearly framed mitigation program with cost estimates. MAPC.1

Bus Connectivity

The Project site is located within a quarter mile of five MBTA bus routes that directly serve Union Square: Routes 85, 86, 87, 91, and CT2. Five additional MBTA bus routes (69, 80, 83, 88, and 90) provide service within a half-mile of the Project site. The Project is designed and intended to build upon the expanded access that will be created by the GLX.

MAPC recognizes that the Proponent has been a major partner and contributor to the GLX project, including the coordination of design elements to benefit MBTA operations and access. US2 has agreed to fund approximately $5.8 million toward the City's GLX payment. These payments will help offset the City's commitment to contribute $50 million to the GLX project.

Despite the significant investments outlined by the Proponent, it is unclear how the Proponent plans to invest in efficient bus connections to the GLX and other bus service improvements. MAPC wishes to emphasize the importance of detailing commitments to improving bus service which will ensure that the project will realize the proposed 60% non-automobile mode share. The mode share will be critical to reducing the effects of congestion on roadways and associated negative environmental impacts due to increased trips from the development. MAPC.2

MAPC would like to echo the comments in the City of Cambridge's ENF comment letter which states: *While the project is not estimated to generate enough new bus trips to reach crush capacity, the quality of the bus system may be deteriorated by project generated trips contributing to roadway congestion. Even with the completion of the GLX project, efficient, reliable bus connections both to the GLX station as well as throughout the area will be critical to mitigating the traffic and travel impacts of the project on adjacent communities. High quality pedestrian and bicycle facilities, including amenities to increase the comfort of these modes, are also critical.* (page 2)

The FEIR should clearly address how the Proponent will coordinate with the MBTA, specifically identifying how connections to and from the Project (e.g., Kendall Square, Davis Square, Harvard Square, Sullivan Square) can be enhanced for the MBTA buses servicing this area. MAPC.3

The Proponent should commit to an ongoing partnership with the MBTA and the City of Somerville to address how these MBTA bus routes could be improved to maximize ridership. This includes, but is not limited to, engagement in the Better Bus project, review of pick-up/drop-off locations, bus stop improvements, scheduling, route adjustments, and traffic signal modifications. Modifying bus routes to improve service and reliability for customers are essential service adjustments needed to achieve the 60% non-automobile travel mode share. A high degree of bus transit connectivity will allow employees, residents, and visitors to avoid having to drive to and from the Project site. MAPC.4

Parking

MAPC commends the both the City of Somerville and the Proponent for recognizing that parking management is a key element to managing vehicular demand. The City has already established mandatory requirements for best practices in parking management: "unbundled" parking and appropriate parking pricing. These requirements are included in the City's Coordinated Development Special Permit and Mobility Management Plan. In addition, the Proponent intends to include unbundled parking, market rate pricing, daily pricing, and limiting dedicated parking as measures to manage parking.

Allocation of Parking Spaces

The Proponent plans to establish a 1,495 parking space maximum for the Project. MAPC appreciates that the Proponent has provided the number of proposed parking spaces for each lot as well as included information that the collective parking ratio is 0.63 spaces per 1,000 square feet.

MAPC respectfully requests that the Proponent provide information regarding the allocation of proposed parking spaces to land use for each Project phase, preferably in a matrix format along with an explanation of the methodology used to determine the total parking proposed. The methodology should include an analysis of the anticipated parking usage based on the different types of parking demand (e.g., market residential, affordable residential[2], employee, hotel guest) and projected parking demand at different times of day. MAPC.5

[2] Please note the importance of distinguishing between market and affordable residential, since the residents of affordable units may own fewer cars and take fewer auto trips.

Shared Parking

While MAPC is pleased the Proponent indicates that parking will be managed to minimize auto travel by implementing shared parking policies. The FEIR should include a shared parking analysis and specific plans to implement shared parking. Without this information, we are unable to assess whether the number could be reduced to limit environmental impact and to encourage non-auto access to the site. MAPC.6

Lower Mystic Recommendation to Establish Regional Mitigation Fund

MAPC is particularly interested in monitoring the development that takes place for this Project since it is contained within the study area of the Lower Mystic Regional Working Group (LMRWG) www.lowermysticstudy.org. The LMRWG has developed a comprehensive regional land use and transportation study that was required by your office as part of the Encore Boston Harbor MEPA process. This study is in the final stages of approval for public release. Encore Boston Harbor, MassDOT, and the Barr Foundation are funding the Working Group, with MassDOT as the Working Group lead. MAPC is a member, along with the cities of Everett, Boston, and Somerville.

As one of the first projects to occur within the framework of the LMRWG Study, it is critical that the Proponent's transportation mitigation program be aligned with the Study's recommendations. MAPC appreciates that the Proponent has confirmed that they will continually work with the City to support the recommendations as appropriate.

Affordable Housing

MAPC applauds the Proponent for recognizing that maintaining local housing affordability is an important underpinning of economic growth and is a goal in the Union Square Neighborhood Revitalization Plan adopted by the City in 2016. Somerville's inclusionary housing policy dictates that 20% of all housing provided be permanently affordable.

Approximately 200 of the 998 units will designated as permanently affordable across three income tiers. Furthermore, 15% of these affordable units will be three-bedroom, deepening the City`s commitment to families who desire to call Somerville home. Additionally, the Proponent will fund over $10.9 million of housing linkage payments that can be utilized to address other local housing needs.

It is important to note that affordable units may also have an impact on traffic, because the owners or renters of affordable units may own fewer vehicles, generate fewer vehicular trips, and depend more frequently on transit, walking, or biking.

6.4 Regional, City, Organization and Public Comment Letters

METROPOLITAN AREA PLANNING COUNCIL

MAPC.1 Include a clearly framed mitigation program with cost estimates.

Table A in Chapter 5 includes a description of the proposed mitigation program by phase. Additional cost estimates have been added to the extent such costs can reasonably be estimated. Since many of the proposed mitigation measures have been committed to by US2, and because many mitigation measure costs cannot reasonably be separated from Project cost, specific dollar costs of every mitigation measure have not been included. Table A includes information on anticipated costs of mitigation measures and public benefits listed therein to the extent such information is available.

MAPC.2 How will the Proponent plan to invest in efficient bus connections to the GLX and other bus service improvements.

As the Project design is further developed and there are more detailed plans for each individual Lot, US2 will improve certain adjacent bus stops and access to the associated building site. The details of the improvements will be determined in concert with the City and following all then applicable MBTA bus stop design guidance. These measures will be enforced through implementation of the CDSP conditions and City's mobility management requirements applicable to the Project. These include a requirement stating that US2 "improve accessibility and comfort, to the extent practicable, at one existing MBTA bus stop along the frontage of each building site (D1.1, D1.2, D2.1, etc.). Building sites where bus stops have already been improved or where no MBTA bus stop exists at the time of DSPR submittal are exempt. Specific improvements must be approved by the Director of Transportation & Infrastructure. The Building Official shall not issue a Certificate of Occupancy subject building until such improvements have been installed or constructed."

Through this condition of its master plan approval, US2 committed to improving the accessibility and comfort of existing bus stops that are located on Project Lot frontages (i.e., six existing bus stops located on Lots D1.2, D2.1, D3.1, D4.3, D6.2 and D7.2). As plans are submitted for each Lot, US2 will work with the City and the MBTA on the location, potential improvement and design of bus stops per the then current MBTA plans and City and MBTA design guidelines. The proposed improvements will be part of the Transportation Access Plan and Mobility Management Plan for each Lot. This process is underway for the bus stop on Prospect Street proximate to Lots D2.1, D2.2 and nearby the future Union Square Station.

In addition, US2 has coordinated with the City to identify potential changes to the bus system that should be evaluated, including:

- Maximizing connections to Sullivan Square;
- Maximizing connections to MBTA Red Line stations, primarily at Kendall, Central, and Harvard stations; and
- Minimizing duplication with Green Line service when open, which could be accomplished by:
    - Considering the elimination of Route 80 which parallels the College Avenue Green Line extension, or terminate at one of the Green Line stations before Lechmere;
    - Considering termination of Route 87 at Union Square, rather than Lechmere; and,
    - Considering termination of Route 88 at Union Square or Washington Street, rather than Lechmere.

Changes to existing routes should occur in conjunction with or following the initiation of Green Line service. The additional service time saved by these changes should be re-invested in local services as determined to relieve overcrowding, increase frequency or provide additional connections in and around the Union Square area. Please see Section 2.5 for more information.

To fund these potential improvements, the City will allocate a portion of the Proponent's committed offsite infrastructure and future phase contribution monies to rapid-response, short-term mobility and safety retrofits in the Project area.

MAPC.3 **Address how the Proponent will coordinate with the MBTA, specifically identifying how connections to and from the Project (e.g., Kendall Square, Davis Square, Harvard Square, Sullivan Square) can be enhanced for the MBTA buses servicing this area.**

US2 will continue to work proactively with the City and the MBTA, and participate in ongoing processes to ensure that potential improvements to MBTA service in the Union Square area are strongly considered. In response to DEIR comments, US2 has coordinated with the City to identify potential changes that should be evaluated, including:

- Maximizing connections to Sullivan Square;
- Maximizing connections to MBTA Red Line stations, primarily at Kendall, Central, and Harvard stations; and

- Minimizing duplication with Green Line service when open, which could be accomplished by:
  - Considering the elimination of Route 80 which parallels the College Avenue Green Line extension, or terminate at one of the Green Line stations before Lechmere;
  - Considering termination of Route 87 at Union Square, rather than Lechmere; and,
  - Considering termination of Route 88 at Union Square or Washington Street, rather than Lechmere.

Changes to existing routes should occur in conjunction with or following the initiation of Green Line service. The additional service time saved by these changes should be re-invested in local services as determined to relieve overcrowding, increase frequency or provide additional connections in and around the Union Square area. Please see Section 2.5 for more information.

MAPC.4 **Commit to an ongoing partnership with the MBTA and the City of Somerville to address how these MBTA bus routes could be improved to maximize ridership.**

As part of its commitment to a multi-modal future for Union Square, US2 commits to working in partnership with the MBTA and the City to improve bus ridership.

MAPC.5 **Provide information regarding the allocation of proposed parking spaces to land use for each Project phase, preferably in a matrix format along with an explanation of the methodology used to determine the total parking proposed. The methodology should include an analysis of the anticipated parking usage based on the different types of parking demand (e.g., market residential, affordable residential, employee, hotel guest) and projected parking demand at different times of day.**

As described in Section 2.3, the basis of the parking demand model used by US2 to evaluate the shared parking strategy described in the DEIR has been under development with, by, and for the City through multiple processes governing Union Square and beyond, including the Union Square Neighborhood Plan, the CDSP, Union Square Zoning, and the City's Parking Demand Model.

The original analysis and concept for the Shared Parking Model was developed through the Union Square Neighborhood Plan. The Shared Parking Model included a review of potential land use for the entire Neighborhood Plan area, which extended well beyond the D Blocks included in the Project. It further explored factors to be applied that would reduce overall parking demand and placed them within a Union Square context.

Although the Project is currently anticipated to be developed as phases as described in Section 1.2.3.1, parking associated with individual Lots will be realized as conditions, needs and opportunities dictate. Parking will be an ongoing consideration, but supply will be provided by Lot as described in Section 1.2.3.1. As required by Union Square Zoning and codified in the CDSP, all commercial parking will be shared between Project uses and available to the public as required by zoning. All parking, as it is built out, will be gate controlled, with parkers having access through a ticketing or reader card system. See Section 2.3.2 for additional details regarding the management of commercial parking. Appendix D3 includes the results of the Shared Parking Model for the Project, which includes parking spaces by use.

MAPC.6 **Include a shared parking analysis and specific plans to implement shared parking.**

The Project garages have been planned and designed with an emphasis on shared vehicle use that has resulted in smaller scale garages and fewer parking spaces than other nearby developments. Section 4.5.6 of the DEIR provided a description of the shared parking analysis completed for the Project. The basis of the Parking Demand Model used by US2 to evaluate the shared parking strategy described in the DEIR is the City's parking demand estimator which was used to estimate potential parking demand for the Project based on the proposed program of office/lab, retail, hotel, and residential uses. Section 2.3 of this FEIR provides additional detail on the shared parking analysis methodology. Appendix D3 includes the results of the Shared Parking Model for the Project, which includes parking spaces by use.

The approved Union Square Zoning Overlay District includes a carefully considered parking policy that requires a shared parking strategy, permits a maximum of 1,500 total parking spaces, and has no required parking minimum ratios. The proposed Project and its TDM approach is responsive to this policy and includes 1,495 proposed parking spaces. The proposed parking levels are based on developing a mix of Project uses, operating shared parking facilities and the parking management strategy outlined in the DEIR. In an effort to encourage a higher rate of shared vehicle use as requested by the commenter, the Project will provide approximately 14 parking spaces dedicated to car sharing, and US2 has agreed to provide additional incentives for car sharing services for every residential unit.

CITY OF SOMERVILLE, MASSACHUSETTS

MAYOR'S OFFICE OF STRATEGIC PLANNING & COMMUNITY DEVELOPMENT

JOSEPH A. CURTATONE
MAYOR

GEORGE PROAKIS
EXECUTIVE DIRECTOR

March 1, 2019

Secretary Matthew Beaton
Executive Office of Energy and Environmental Affairs
Attn: Alex Strysky
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Strysky,

Thank you for the opportunity to comment on the submitted Draft Environmental Impact Report (DEIR) for the proposed Union Square Redevelopment (EEA#15889), dated January 15, 2019 and published in the MEPA Environmental Monitor on January 23, 2019.

The City of Somerville's support for the Project is well-articulated in our comment letter on the Expanded Environmental Notification Form (EENF) dated August 23, 2018 (included in its entirety in the Proponent's DEIR). The Project as proposed is broadly consistent with our community's vision for equitable and sustainable growth oriented around low-carbon mobility in the Union Square district. The Somerville Planning Board issued a conditional approval of the Project's Coordinated Development Special Permit (CDSP) entitlement in a record of decision dated December 14, 2017. The next stage of local zoning review is Design and Site Plan Review (DSPR) for the Project's first development block; the Applicant's intent is to begin the public hearing process in Spring 2019.

This comment letter will focus on the specific elements of the DEIR as follows:

Transportation Impact Study

The Proponent has provided a Transportation Impact Study (TIS) that is consistent with MassDOT/EEA guidelines and furthermore meets the submittal requirements of the City of Somerville's Coordinated Development Special Permit process. The City's requirements are tailored to explicitly evaluate multimodal level of service, pedestrian and bicycle level of comfort, and bus ridership conditions.

The TIS includes evaluations that are essential to the achieving the City's vision of a low-carbon, transit-focused, pedestrian- and bicycle-oriented mobility network, including:

- Bus capacity analysis by individual route and stop
- Pedestrian assessment, including counts by age and gender and level-of-service analysis
- Bicycle assessment, including age and gender counts, trip distribution and level-of-traffic-stress (LTS) analysis
- Vehicular origin-destination analysis using cell-phone GPS data
- Multimodal level-of-service analysis at 37 study area intersections

The DEIR uses more conservative assumptions about background traffic growth than the Project's EENF had used. Consistent with the Secretary's Certificate on the EENF, the Proponent has used a 0.25% background growth factor for motor vehicle traffic. Similarly, the DEIR responds to the EENF Certificate by analyzing the transportation impacts of nearby development projects and adding those trips to the horizon year. The City has implemented certain improvements to the multimodal transportation network since the EENF filing (most notably the newly-installed Protected Bike Lanes on Webster Avenue south of Prospect Street); the DEIR reflects these changed conditions compared to the EENF stage.

Mode Share Commitments, Monitoring and Mitigation

The Project is required under local zoning to achieve and maintain an ambitious and progressive 60% non-automobile mode share for Project-related trips. The policy framework for this requirement is well-articulated in the City's comment letter on the Proponent's EENF. The Proponent is required to perform annual monitoring of travel behavior for new residents, employees and customers, and to adjust its Transportation Demand Management (TDM) measures accordingly based on real-world performance data in order to comply with the 60% non-automobile mode share performance standard.

These requirements are enforceable: the municipal Coordinated Development Special Permit (CDSP) approval is conditioned on implementation of a district-scale Mobility Management Plan and its identified TDM measures. Furthermore, the municipal Design and Site Plan Review (DSPR) application requires submittal and approval of a Mobility Management Plan and associated TDM measures customized to the individual development site.

Failure to implement approved Transportation Demand Management programs and services under a permitted Mobility Management Plan subjects the property owner to penalties including $300 / day fines. The continued right to operate a private parking facility permitted under Somerville's local zoning framework is dependent on ongoing compliance with the approved Mobility Management Plan.

Bus Transit Facilities

The City's comment letter on the Proponent's EENF includes extensive discussion of bus service and facility upgrades planned by the City in partnership with the MBTA; for stakeholder reference, that letter is included in the DEIR Section 14 (page 766).

The City wishes to reiterate that the Proponent is obligated under the conditions of its Coordinated Development Special Permit to upgrade bus stop facilities to the satisfaction of the City wherever an MBTA bus stop exists along a frontage to be redeveloped by the Project. The City looks forward to working with the Proponent during its local Design and Site Plan Review (DSPR) permitting process for the Phase 1 Project to ensure that stop 2531 (which is located along the Prospect Street priority bus lane) is improved to invite bus ridership and facilitate intermodal transfers to the MBTA Green Line light rail station at Union Square.

Greenhouse Gas (GHG) Emissions

The DEIR states that at the time of filing, building design for the D2 Block has advanced to 60% design, while the balance of the Project buildings have advanced to a 10% design level. Many key building systems are being designed in phases as individual development blocks advance in the design and permitting process. With those design milestones clearly articulated, the DEIR provides an analysis of building energy performance under various alternative scenarios. A Mitigation Matrix is provided in Table 7-1.

The DEIR states that a high-performance building envelope is currently included in the Project design and modelling for the Proposed case. The DEIR states that the Project buildings are expected to achieve "better than code" performance of the building envelope; the City looks forward to reviewing more specific proposals during local zoning the Design and Site Plan Review (DSPR) submittal expected in Spring 2019 for the D2 development block.

The DEIR states that the Proponent is currently performing further evaluation of combined heat and power (CHP) solutions. The City looks forward to continued analysis of this alternative; the analysis should articulate the costs and benefits of transitioning to a non-fossil fuel CHP system. CS.1

The DEIR includes an analysis of the benefit of variable refrigerant flow (VRF) heat pumps for the residential tower component of the D2 block. Similarly, an analysis of rooftop photovoltaic treatments is provided.

During the Proponent's Coordinated Development Special Permit (CDSP) process, the City identified a number of building performance questions that will be addressed during the DSPR stage of local zoning review. Each DSPR submittal is required to document how the proposed development, including civic spaces, public realm improvements and buildings will assist in the City's stated objective to be Net Zero by 2050. The Proponent is scheduled to submit its DSPR submission for the D2 development block in the Spring of 2019. The City looks forward to the next phase of local review on these elements of Project design. It is critical that the Proponent

continue to consider and assess alternatives to reduce building GHG emissions well below code and plan a project with a clear pathway to net-zero carbon emissions within the next thirty years. CS.2

Adaptation and Resiliency

The DEIR describes the Proponent's design intent to not place any critical building systems within any identified 500-year flood hazard zone. For the D2 block, which has advanced the furthest into building and site design, the Proponent is working with the design and construction team for the City's Somerville Avenue Utility and Streetscape Improvements project to coordinate finished elevations at back-of-sidewalk with building site elevations.

As a condition of the Proponent's Coordinated Development Special Permit (CDSP), the Project is required to identify vulnerabilities and/or risk for each development parcel during the Design and Site Plan Review (DSPR) based on the City's Climate Change Vulnerability Assessment. Each DSPR application is required to clearly identify the extent and nature of planning / design interventions necessary to mitigate those risks. Another condition of the Proponent's CDSP is that each DSPR submittal must document how the proposed development, including civic spaces, public realm improvements and buildings will help to reduce the urban heat island effect. The City looks forward to reviewing the Proponent's DSPR submittal for the D2 block to ensure compliance with these objectives. Detailed review of the Project's later-phase development blocks will occur through the local DSPR process as the Proponent advances each phase.

Stormwater

The Proponent has provided an analysis of peak discharge rates for the D2 development block in Tables 9-1 and 9-2. An overall drainage plan is provided in Figures 9-1, 9-2, 9-3 and 9-4. Stormwater management systems are being designed in phases as individual development blocks advance in the design and permitting process. The City's comment letter on the Project's EENF discusses in detail the the City's current efforts to separate historic combined sewer and stormwater facilities in Somerville Avenue to provide storage capacity and reduce flows to the MWRA Cambridge Branch sewer at McGrath Highway and Medford Street. The Project will send flows to this system upon completion, and the Proponent is required to provide both direct funds (through local mitigation payments) and indirect funds (through new incremental tax revenues under the City's adopted District Improvement Financing program) to facilitate construction of the new stormwater infrastructure.

The Proponent is required to demonstrate compliance with the City of Somerville's Stormwater Ordinance, which provides for removal of Inflow / Infiltration (I/I) from legacy combined sewer systems. Furthermore, the Proponent is required to comply with the standards of the Massachusetts Stormwater Handbook, which requires new development to address water quality in addition to reducing I/I. The City looks forward to reviewing the detailed proposals for high-performing landscape design in its required civic spaces, as well as green roof and associated rainwater capture systems during the Design and Site Plan Review (DSPR) phase of local permitting. The DEIR notes that the City's current $63 million Somerville Avenue Streetscape

and Utility construction includes extensive street-level green infrastructure treatments intended to improve water quality and mitigate the impact of street and sidewalk runoff. The Proponent will provide financial support for this construction through its development covenant mitigation payments.

Wastewater

The Proponent has provided hydraulic capacity analyses for individual sewer mains in Tables 10-2 and 10-3. An overall sewer plan is provided in Figures 10-1, 10-2, 10-3 and 10-4. Sanitary sewer systems are being designed in phases as individual development blocks advance in the design and permitting process.

The City is currently implementing a long-term strategy to create capacity in local and regional sewers by constructing separated stormwater infrastructure and reducing I/I. The City requires all new development to mitigate the impact of new wastewater flows on our combined sewer system at a 4:1 ratio, consistent with MassDEP best practices. As a condition of local permitting, the Proponent will be required to identify and eliminate I/I into Somerville's system; or, by providing a payment-in-lieu at a per-gallon rate. The City will use these funds to identify and eliminate I/I flows to the combined sewer system. CS.3

Thank you for the opportunity to comment on the Union Square Redevelopment DEIR. The City looks forward to continuing its collaboration with the Proponent and with all stakeholders in the MEPA process. Please do not hesitate to contact me with any question or concerns.

Sincerely,

Brad Rawson
Director, Transportation & Infrastructure
Mayor's Office of Strategic Planning & Community Development
City of Somerville, MA

CS.1 **The City looks forward to continued analysis of this alternative; the analysis should articulate the costs and benefits of transitioning to a non-fossil fuel CHP system.**

The DEIR included a thorough CHP analysis. Ultimately, the analysis demonstrated that a potential CHP system would not be as effective in achieving the project's GHG reduction goals as the high-efficiency systems that have been proposed. Provided there is little precedent for non-fossil fuel CHP systems, the introduction of a CHP system would likely result in a longer-term commitment to fossil fuels than may otherwise be possible. Similarly, the complexity inherent in transitioning a fossil-fuel CHP system away from carbon to renewables would unnecessarily commit buildings to a carbon dependency for a longer period than might otherwise be necessary. While non-fossil fuel burning CHP systems are in development, they remain cost-prohibitive at this time. As technology evolves, the design team will continue to evaluate any systems that may present the opportunity to reduce GHG emissions beyond current commitments.

CS.2 **Consider and assess alternatives to reduce building GHG emissions well below code and plan a project with a clear pathway to net-zero carbon emissions within the next thirty years.**

The FEIR describes the Project's consistency with City's carbon neutrality goals in Section 3.6, identifying the action plans in place to assess compliance and ensure the Project will remain current within the changing context of incentives, system technology, and material science that will inform new paths to resilience and carbon neutrality over the long term.

The Project, through the FEIR, has advanced study around Passive House (Section 3.4), building electrification (Section 3.5), renewables (Section 3.7), and purchase of carbon offsets; all stated objectives of Somerville Climate Forward (2018). These studies, in parallel with Somerville's Sustainable and Resilient Buildings Questionnaire, required for each Development Review Application, will demonstrate consistency with the City's carbon neutrality goal over time.

In the near term, and absent certainty around future incentives, commitments to Passive House achievement, set-aside area for photovoltaics, green-power purchasing, and green vehicle infrastructure, position the Project as a resilient model to follow. Please refer to Chapter 3 for additional details.

The proposed building systems reflected in this FEIR all reduce building GHG emissions well below base case (code) levels. Please refer to Table 3-10 (and copied below) for the Project's projected GHG emissions reduction estimate.

	Baseline	Proposed	Difference	
	tons/yr			percent
Stationary Sources	18,487	15,899	-2,598	-14.0%
Mobile Sources	2770.2	2770.2	0	0%

A thorough analysis of electric systems has been detailed in the FEIR. While the anticipated lab uses in a number of proposed buildings make a Project-wide commitment to all-electric systems impossible, electric systems are anticipated to be incorporated in the Project where appropriate and financially viable. Please refer to Section 3.3 for an analysis of electric systems including GHG reduction benefits and cost paybacks.

Additionally, this FEIR contains a thorough Passive House analysis of the multi-family and high-rise residential buildings. Please refer to Section 3.4 and Appendix E for details. Passive House will be considered for all residential buildings built in Phases 2, 3-South and 3-North. Passive House principles are proposed in current designs across Union Square. However, many of these buildings may ultimately prove to be unsuited to Passive House certification, for either technological or financial reasons.

Despite these costs, challenges, the nascent market, and a lack of experience, US2 is committed to advancing the goal of the State, the City, and the Union Square neighborhood to see Passive House in Union Square. Provided its unique suitability, and prime location near the future Union Square Station, US2 will commit to delivering the multi-family building on D4.3 as a Passive House Project. Please refer to Section 3.4 for details.

CS.3 **As a condition of local permitting, the Proponent will be required to identify and eliminate I/I into Somerville's system; or, by providing a payment-in-lieu at a per-gallon rate.**

US2 has reviewed the City's 4:1 I/I mitigation policy and has discussed the application of the policy to the Project with the City's engineering department. US2 will continue to work with the City to meet I/I requirements on a Lot by Lot basis as the Project is implemented.

March 01, 2019

Secretary, Matthew A. Beaton
Attn: MEPA Office, Alex Strysky
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Via email to Mr. Alex Strysky
RE: **EEA#15889, DEIR, Union Square Redevelopment, Somerville MA**
Dear Secretary Beaton,

The Union Square Neighborhood Council is a publicly elected representative body created in December 2017 dedicated to serving the Union Square community, addressing the neighborhood's concerns, and advocating for the community member's needs.

We, the Union Square Neighborhood Council (USNC) Board Members, appreciate the work the Proponent, US2 and the Somerville Redevelopment Authority (SRA), have dedicated to creating the Draft Environmental Impact Report (DEIR) submitted to the Massachusetts Environmental Policy Act. Upon thorough review of this document, we would like to submit the following comments regarding the content of this draft document.

A. Public Comment Process

The Draft EIR (DEIR) as filed includes a separation of comments into categories of "supportive" and "opposition." However, MEPA is simply charged with judging the quality of the documentation and its mitigation, including via public comment. The process of seeking out groups or individuals to do nothing more than write letters of support is contrary to MEPA procedures. In the Final EIR (FEIR), there should be only two categories of comments received, 1) those from federal, state, and city agencies, and 2) those from citizens, including groups. No special organizing of comments should occur, and they should be printed in order of receipt by the MEPA office. Responses to comments should direct the reader to FEIR page numbers and not chapter numbers to allow ease of access by the general reader and validation of the Proponent's claims. USNC.1

B. Alternative Designs

The developer provided certain required "Reduced Build" alternatives that decrease the amount of housing alone. However, the developer failed to explore other more creative ways of reducing density that would sacrifice neither housing nor laboratory space, for example, by choosing to locate some of the parking garages underground, as is done regularly in these types of developments. For example, a planned project just a few blocks away in Boynton Yards with primarily commercial development has plans for four story underground parking, which will allow for much more future open space. Moving at least some parking underground in this development would free up additional precious land for green and open space and effectively reduce density without sacrificing housing and commercial development. The long-term social and environmental benefits of such choices would greatly outweigh the upfront costs. USNC.2

We also believe — based on numerous scientific studies previously submitted by Wig Zamore in his comments for the project — that significant air quality improvements in the public space could be achieved if a building were blocking air pollution from an enclosed courtyard. The current proposed design exposes the public to massive plumes of nanoparticulate pollution from idling car traffic and poses a long and short term health hazard for people who linger in the public space. This point — and the supporting documents submitted by Mr. Zamore — was ignored. Any FEIR must include calculations about the projected impact of airborne nanoparticulates, and what harm could be reduced by adding physical buffers between idling cars and the respiratory systems of human beings. USNC.3

We believe the Proponent must put more weight on these long term benefits to the community in assessing environmental impact. Specifically, an alternative design has been proposed for D2 that places parking underground and improves and increases green and open space directly adjacent to the major planned public transit Green Line stop in Union Square. This alternative has strong support from the community, and we have yet to see a detailed response to this design from the Proponent.

Last, we discuss in more detail under the Transportation Section how there should be more discussion of more public transit-heavy alternative designs.

C. Accessibility to the New MBTA Green Line Station

The only planned accessible route to the Union Square Green Line Station is via the corner of Prospect St. and Somerville Ave. There will be additional drop-off in front of the station that requires cars or shuttles to go all the way around the new development from the south to enter it from the Somerville Ave. direction on the north side.

Furthermore, there will be no access to the Green Line station from south of Union Square or Inman Square. This will severely disincentive the use of the station for the broader community. This is not just an issue for the elderly and those with disabilities but also families with strollers, for example. The MBTA has stated that there is no way to allow access to the Station from the South by going across the train tracks. Therefore, we believe there must an an accessible way of reaching the Green Line Station from the Prospect St. bridge via an elevator. We believe such access is necessary for compliance with the Americans with Disabilities Act (ADA) as pointed out by MassDOT in its submitted comments. This will also improve access from the south by everyone, which will significantly increase use of the Green Line station to desired levels as we believe is necessary under the Transportation section below. As we understand it, achieving this goal will require improved cooperation between the Proponent, City of Somerville, MassDOT, the MBTA, and residents. This must be done as soon as possible (possibly with the help of the MEPA office) to ensure proper design of the Union Square Green Line Station and the D2 development block for accessibility, increased public transit use, and higher levels of environmental mitigation. USNC.4

D. Parking

Clear data show that transportation around this project must depend much more on public transportation via the new Green Line Stations as compared to additional vehicular traffic and new parking. A Somerville City sponsored study recommends a parking ratio of 0.47 (ratio of parking spots to households), which would correspond to less than 1,200 new parking spaces added for this project. The Proponent is planning to construct several parking garages for a total of ~1,495 off-street spaces. They should adhere to the original parking ratio value by reducing the amount of parking to disincentivize car usage and take full advantage of the Green Line Extension. Furthermore, a high rate of shared vehicle uses should be considered. The most effective way to cut congestion and pollution is to make driving unappealing. Union Square already has some of the worst traffic congestion and pollution in the area. Taking extra cars off the road by limiting parking space will increase the well-being and the safety of all residents and visitors. USNC.5

As stated in the Alternative Design Section, locating parking garages underground and covering those surfaces with more green space would significantly increase climate resilience in the area and increase buffer zones between open space and pollution from major trafficked streets. USNC.6

E. Transportation

The original Environmental Notification Form (ENF) and the DEIR assume 22% rail and bus transit mode share vs. auto mode share rising to 40% from 38.8% currently. The alternative design plans do not assume any possible changes in these mode share percentages, simply a decrease in the amount of development. This is a significant oversight in ways to truly mitigate traffic congestion and pollution. Considering the importance of the Green Line Extension in decreasing use of vehicles through Union Square, the transit mode share must be a much larger portion of transportation method to have any significant environmental mitigation impact. As with the accessibility issues, to achieve this goal will require improved cooperation between the City of Somerville, MassDOT, the MBTA, and residents. Ultimately, a transit alternative with up to 60% transit share and 15% auto share is the only option capable of allowing Somerville to have a sustainable future in mitigating the impact of cars in the City. USNC.7

Achieving such a goal would require the MBTA to significantly improve their transit service and provide necessary increased capacity to the Green Line Extension. Such improvements are necessary to absorb new trips generated from the planned development, whereas the roads cannot bear additional vehicle traffic and are already far beyond capacity. MEPA requires an appropriate definition for Transit Oriented Development that is a high bar required of development plans. We suggest that this would mean transit trips must at a bare minimum exceed vehicle trips. MEPA also needs to develop guidelines to properly assess the capacity of mass transit in urban areas, especially in areas like Union Square where there is quite literally no room for increased traffic capacity. In the past, Green Line trolley service was nine times more frequent than current rush-hour schedules. The original ENF plan for Suffolk Downs was for three transit trips for every two vehicle trips.The result for Union square is a very disappointing 1.1 transit trips for every two vehicle trips. Why should Union Square be only 1/3 of the transit trip rate for Suffolk Downs? This suggests that there is no technological limitation to increasing capacity, but primarily an operational desire to do so by the MBTA, to encourage higher use of rail. Such a change by the MBTA would be quite affordable and necessary. Additionally, any improved capacity on the Green Line would benefit all riders, including those whose destination is not Union Square. There

should also be more detailed analysis of bus waiting times and methods to solve issues such as bus bunching, which significantly increase wait times, exposing people to the weather elements. Any Final EIR should provide a study of these transit alternatives and look into the capabilities and potential of increased trolley service on the Green Line and increased bus lanes around Union Square to achieve these alternatives. USNC.8

F. Pedestrian Access and Traffic Analysis

Somerville planning documents dating from SomerVision through the Union Square Neighborhood Plan and beyond have stressed the importance of improved pedestrian access as the priority above all other modes of transit (with public transit immediately following in importance). It appears that the DEIR traffic signal operations have unusually low WALK times and unusually low delay times, far below the minimum times set by the *Manual for Uniform Traffic Control Devices*, a Federal document fully accepted and applicable to Massachusetts. Additionally, there is no description of the formulas used to estimate delay and how the number of lanes and the crossing volumes enter into the delay estimate. The estimates also do not include whether the crosswalk is "exclusive WALK" or "concurrent WALK". The Final EIR must include proper documentation of their calculations, with increased WALK times and decreased cycle lengths at signalized intersections. USNC.9

The original ENF and DEIR look at 37 intersections, but there are primarily 5 to 10 intersections which create the most bottlenecks and traffic issues in Union Square, with challenges to both vehicles and pedestrians. The locations with the most bottlenecks require more detailed analysis showing full final phasing, pedestrian crossing times, and effects of short lanes. USNC.10

G. Air Quality

Impacts from increased traffic through Union Square will be significant, as recognized by the Proponent and pointed out by numerous comments to the Executive Office of Energy and Environmental Affairs (EEA). Parking garages should be placed away from first floors near sidewalks and pedestrian areas as much as possible. As stated above, underground parking should be promoted as much as possible. Air quality in new buildings will be a big issue given that levels of congestion at major intersections. All buildings should be built with the best available technology of the moment to mitigate indoor air pollution (LEEDv4 BD+C has a minimum indoor air quality performance requirement for certification; however, that doesn't include air filtration systems). USNC.11

H. Greenhouse Gas Analysis/Climate Change Resilience and Adaptation

The Proponent does not commit to renewable energy generation on site, citing current costs being prohibitive for solar and wind power development. Their indication that they will consider renewable energy later on in the project is very vague. Furthermore, they do not even commit to any minimal percentage of renewable energy purchase, even though there are many available, cost-effective renewable energy sources already on-line that have been championed by the City of Somerville and the State of Massachusetts Executive Office of Energy and Environmental Affairs (EEA).

The Proponent did not commit to much more than "exploring viability" for many measures proposed by several agencies to minimize energy use in the built environment. The developer plans to certify 11 of the 17 buildings as LEED v4 BD+C Gold or Silver; however, these standards are already becoming out of date, and there are better techniques to achieve the goals of climate mitigation, adaptation, and well-being of occupants such as Passive House (PH). The Proponent has stated the calculated payback period for PH is too long (24 years). However, this number is from a NYSERDA study for a tall building project and didn't factor in the incentives provided by the State of Massachusetts outlined in the MassDOER comments. Furthermore, this study actually praises the benefits of PH design contrary to the indications by the developer. Additionally, the Proponent claims that no local examples under similar regulations to their planned Development exist for true cost comparisons. However, Distillery North in South Boston and Concord Highlands in Cambridge (under development) represent two examples of multi-family residences built to PH standards.

The current proposal would reduce building energy consumption by only 14% compared to the base case. At a minimum, the developer should strive for energy use intensity at least 25% below ASHRAE 90.1 2010. This aligns with both the new proposed Somerville Zoning code and the Somerville Climate Forward Plan's Priority Action of Adopt Flood and Extreme Heat Resilience Standards for New Construction. The FEIR should more thoroughly analyze the use of more energy efficient and climate resilient building standards, especially for buildings that are planned in the years to come. USNC.12

I. Soil Contamination

The Proponent has provided a long list of historical data of known contaminants measured in each of the planned development parcels, with details about the regulatory status of each area. However, the developer has stated that many areas cannot be further tested because they do not own the land yet. This results in a large uncertainty on the magnitude of the contaminants that will be released in the air and that could spread horizontally through the soil once development starts. Mitigation contingency plans should be prepared to account for possible higher levels of contamination on all planned development sites. USNC.13

J. Flooding Issues

Union Square drainage systems eventually reach a four-foot diameter pipe at the Millers River Basin, which has been clogged for many years in the past. When clogged, this leads to immense flooding in the Union Square area causing significant property and environmental damage. This pipe is under the control of the MBTA and as part of their licensing agreement for ownership of North Point Land, they are required to keep this pipe clear. The pipe was recently cleaned out by the MBTA at the demand of the Environmental Protection Agency. State agencies with EPA backing should enforce this license and its condition requiring maintenance, to the effect that the state will suspend the Chapter 91 license of the railroad if it does not provide proper maintenance, and will suspend the right of users of the railroad land from continuing to use the filled land until necessary maintenance has been completed. Need for maintenance should be defined by a drop of 25% in pipe capacity due to clogging.

Conclusions

Overall we, the Council, are pleased to see that the Proponent has made progress on performing a full environmental impact of the entire planned development. However, there are still many areas of the document lacking necessary details and explanations. In particular, many of the excellent suggestions from this Council, the broader community, and other State agencies in response to the Phase I Waiver request have been largely ignored. We respectfully would like the Proponent to address such requests in detail with proper data and analysis before the State accepts a FEIR. Nonetheless, according to the developer's own assessment, many parcels of the planned development cannot be further tested for mitigation of important environmental hazards due to property ownership reasons. Given all these concerns, we would like an enforcement mechanism in the FEIR that establishes a clear process and accountability measures to ensure that all required mitigation actions the Proponent promises and future unforeseen mitigation requirements will in fact be performed in the future to protect the health of Union Square residents and workers.

Please do not hesitate to contact the Council with any questions or concerns.

Sincerely,

The Union Square Neighborhood Council

Afruza Akther
Tori Antonino
Ben Baldwin
Ben Bradlow
Ann Camara
Bill Cavellini
Shane Clyburn
Andrew Greenspon, MEPA comment organizer
Michèle Hansen
Jacob Kramer
Paola Massoli
Bill Shelton
Ellie Tiglao
Pennie Taylor
Johny Vens Vital

USNC.1 **In the FEIR, there should be only two categories of comments received, 1) those from federal, state, and city agencies, and 2) those from citizens, including groups. No special organizing of comments should occur, and they should be printed in order of receipt by the MEPA office. Responses to comments should direct the reader to FEIR page numbers and not chapter numbers to allow ease of access by the general reader and validation of the Proponent's claims.**

The comment letters have been organized by State Agency, Regional Agency, Local Government, Local Community Groups, and General Public. This organization is done to help each interested party find their respective comment letter and responses.

To ensure accuracy of references in the FEIR responses to comments, section numbers are used instead of page numbers since most responses refer to text that is covered on multiple pages. In addition, most individuals receive a searchable digital version of the document, which typically has a different page number system than what is shown on the page, and also includes bookmarks for each section, allowing for quick and easy access between sections. To minimize the need to read every section referenced in a response, the Project team has provided summaries of longer sections in the response and responded as directly as feasible to each comment.

USNC.2 **The developer provided certain required "Reduced Build" alternatives that describe the amount of housing. However, the developer failed to explore other more creative ways of reducing density that would sacrifice neither housing nor laboratory space, for example, by choosing to locate some of the parking garages underground, as is done regularly in these types of developments.**

As part of preparing the additional alternatives presented in the DEIR, US2 considered the goals of the overall Project, the requirements of the Union Square Zoning and the feasibility of the alternative development scenarios. Throughout the Project planning process, a primary objective for Union Square's revitalization was to create commercial spaces, jobs and commercial taxes. In furtherance of this goal, the ratio of commercial to residential mix for the overall development was heavily discussed during the Board of Alderman's approval of the Union Square Zoning. Ultimately, the City's Union Square Zoning set a requirement that 60% of the Project must be commercial development. As such, US2 did not consider reduced density alternatives that decreased the amount of commercial space, and instead focused on reduced residential space to realize the requested "reduced build" scenario.

While moving more parking underground may reduce density as to the portion of improvements that are above ground, as suggested in the comment, and reduction of density can indirectly lead to certain environmental benefits (although it can also lead to reductions in benefits), it does not result in a reduction in the density of the occupied uses

that generate environmental impacts generally speaking. In addition, while the Preferred Alternative includes above-grade parking in some locations, the Preferred Alternative also includes the provision of below-grade parking on portions of D1, D3 and D6, where below-grade parking appears feasible. The feasibility of underground parking is very much site dependent and is not universally included in new developments in the metro area, particularly in suburban locations and in locations subject to flooding. Feasibility depends on the construction cost, site risks and the market conditions, among other factors will be further evaluated as individual Lots are developed. The construction costs include the premium costs associated with underground construction (e.g., excavation, shoring, dewatering, environmental remediation, etc.) as well as the cost of other benefits provided by the Project. The market conditions include the rents that can be achieved for uses in this location. Given these considerations, the "reduced build alternative" did not include any additional below-grade parking.

USNC.3 Air quality impacts on plaza.

The proposed location of the D2 plaza was arrived at through a lengthy public review and planning process, including the process that resulted in the approval of the CDSP. This extensive process included multiple rounds of neighborhood and stakeholder meetings, multiple public hearings, review by planning staff and the Planning Board, and approval of the CDSP, which specifies that the plaza on D2 be located along Prospect Street, where it lines up with the long-planned entrance to the future Union Square Station. The approval of the CDSP followed earlier extensive planning efforts that resulted in *SomerVision* and the Neighborhood Plan, again with many public meetings and hearings.

The D2 plaza is part of the initial Project phase, and since the ENF was filed US2 has been refining D2's design through the City's DSPR process. As part of the D2 planning process, notwithstanding the fact that the location of the D2 plaza was previously evaluated and approved as part of the CDSP process, certain community members suggested that the design of the plaza should be significantly revised in light of concerns regarding pollution impacts from vehicles on Prospect Street. More specifically, these members of the community suggested that US2 consider an alternative plan that would require a significant reconfiguration of the D2 design, an amendment to the CDSP, to accommodate a proposal to move the D2 parking structure underground, situate the plaza in the center of the D2 site and locate a building between Prospect Street and the plaza. It was suggested that this reconfigured design, in part, would serve to minimize certain vehicular pollution impacts on users of the plaza.

As noted in the DEIR, US2 has studied the community proposed alternative, evaluated 'pros' and 'cons', and estimated the cost of the underground parking solution. One of the 'cons' identified was that the revised plaza location is not centered on the pedestrian access to Union Square Station, and the reconfiguration would require pedestrians accessing the station via the 'at-grade' accessible route to travel further.

The reconfigured design would also result in making the plaza area less visible from the street, potentially creating concerns about whether users of the space would perceive it as secluded or unsafe.

To further understand the alternative design proposed by certain members of the community, the City hired a third-party construction estimating consultant to estimate the cost of the alternative and some variants. Ultimately, the premium cost of the alternatives was cost prohibitive. The Project is not able to absorb the additional cost, in addition to all of the other Project benefits outlined herein, and remain financially viable. Project feasibility is further challenged by increased risk, significant schedule delay and design challenges associated with implementation of the alternative plan.

Given the challenges associated with moving the parking underground on D2, and the infeasibility of that approach, which would result in significant delays and substantial costs, US2 revised the civic open space design in other ways to make it more resilient to vehicular pollution impacts. The width of the D2 civic open space has been increased to create greater horizontal separation from the civic open space areas most likely to be populated by pedestrians to Prospect Street vehicles. The elevation of the plaza has also been set at approximately the same elevation as the adjacent Union Square Station, allowing the southern approximately 150 feet of the plaza to benefit from being more than seven vertical feet below Prospect Street. The largest portion of the plaza, where people are most inclined to congregate, is at the southern end of D2 and benefits from the most vertical separation from Prospect Street (approximately 10 to 14 vertical feet). A vegetated landscape buffer has also been planned between the Prospect Street sidewalk and the main pedestrian areas of the plaza to further separate main pedestrian areas on the plaza from vehicles. Additional information regarding the D2 civic open space can be found in Section 1.2.4.4.

USNC.4 **The only planned accessible route to the Union Square Green Line Station is via the corner of Prospect St. and Somerville Ave. There will be additional drop-off in front of the station that requires cars or shuttles to go all the way around the new development from the south to enter it from the Somerville Ave. direction on the north side. Furthermore, there will be no access to the Green Line station from south of Union Square or Inman Square.**

Accessible pedestrian routes to the Union Square Station are planned from the north across the new D2 civic open space and from the east along Charlestown Place. Figure 1-9 depicts D2 site circulation.

US2 has planned for a drop-off area that includes a designated area for the MBTA's The Ride paratransit program adjacent to Union Square Station on Charlestown Place. Providing the drop-off in this location was critical to adhering to the MBTA's requirement that The Ride be located within 100 feet of the station entry.

Charlestown Place can be accessed from the east via Charlestown Street (existing) or from the north via Milk Alley (proposed). Milk Alley can be accessed directly from Somerville Avenue or from Prospect Street via Bennett Court.

As described in Section 1.3, US2 is continuing its consultation with the MBTA, City and the GLX project team regarding access to Union Square Station from the Prospect Street bridge for MBTA patrons. This is particularly important for the station service area to the south of the station that includes portions of Somerville and Cambridge. In order to contribute to improving circulation from the station to the Prospect Street bridge, US2 has offered to amend the D2 design to provide, at no cost to the MBTA, easement rights on the D2 property as required to make way for the MBTA elevator and/or to install a stair adjacent to the MBTA elevator location. US2 has also offered to contribute to the cost of the MBTA elevator's installation. US2 will continue to coordinate with the MBTA, the City and other stakeholders on this issue and remains hopeful that a solution for the MBTA elevator can be identified.

USNC.5 **A Somerville City sponsored study recommends a parking ratio of 0.47 (ratio of parking spots to households), which would correspond to less than 1,200 new parking spaces added for this project. The Proponent is planning to construct several parking garages for a total of ~1,495 off-street spaces. They should adhere to the original parking ratio value by reducing the amount of parking to disincentivize car usage and take full advantage of the Green Line Extension. Furthermore, a high rate of shared vehicle uses should be considered. The most effective way to cut congestion and pollution is to make driving unappealing.**

The approved Union Square Zoning Overlay District includes a carefully considered parking policy that requires a shared parking strategy, permits a maximum of 1,500 total parking spaces, and has no required parking minimum ratios. The proposed Project and its transportation demand management approach is responsive to this policy and includes 1,495 proposed parking spaces. The proposed parking levels are based on developing a mix of Project uses, operating shared parking facilities and the parking management strategy outlined in the DEIR. Please see Section 4.5.6 of the DEIR for more information regarding the parking plan, and Section 2.3 of the FEIR for more information regarding the shared parking model.

In an effort to encourage a higher rate of shared vehicle use as requested by the commenter, the Project will provide approximately 14 of parking spaces dedicated to car sharing, and US2 has agreed to provide additional incentives for car sharing services for every residential unit.

The comment letter notes that the City sponsored a study recommending a ratio of 0.47 "parking spaces to households" which would correspond to less than 1,200 spaces for the proposed development program. US2 is not aware of that specific report, but the Project is targeting ratios of approximately 0.2 to 0.45 per unit for the residential portion of the

Project which is less than the ratio cited. As noted in the DEIR, the residential portion of the mixed-use Project is approximately 40% of the planned development program and the other 60% is commercial uses. The ratio does not appear to consider commercial space, which typically has a higher parking ratio than residential spaces (see ITE Parking generation described in Section 4.5.6 and Appendix B-8 of the DEIR for comparative purposes).

Lastly, as noted above, the DEIR included an unshared parking analysis that was completed using the ITE Parking Generation manual, 4th edition. A summary of this analysis was included in Appendix B-8 of the DEIR and shows that the potential demand if parking were unshared and not managed as described in the DEIR, could be over 4,800 parking spaces. The parking ratios proposed for the Project are below transportation industry standards.

USNC.6 **Locating parking garages underground and covering those surfaces with more green space would significantly increase climate resilience in the area and increase buffer zones between open space and pollution from major trafficked streets.**

The Project master plan includes the provision of underground parking on portions of D1, D3 and D6 where below-grade parking appears feasible. Soil contamination, water table location and soil conditions all influence the feasibility of underground parking. Most of the parking garages proposed within the Project master plan are located below the footprint of proposed buildings. Therefore, relocating those parking garages underground will have minimal impact on the amount of open space provided. For additional information regarding the considerations related to underground parking, please see the response to comment USNC.2.

USNC.7 **The alternative design plans do not assume any possible changes in these mode share percentages, simply a decrease in the amount of development. Study these transit alternatives and look into the capabilities and potential of increased trolley service on the Green Line and increased bus lanes around Union Square to achieve these alternatives.**

The DEIR included an error that mistakenly identified the auto mode share as 38.8%; the current journey to work data for the area around Union Square shows that the non-auto mode share is 38.8% and the auto mode share is 62.2%.

US2 agrees that transit mode share is an important factor in minimizing vehicle use. However, the share of pedestrian and bicycle trips is also an important factor, as not every individual is travelling longer distances that are best done by transit. It is anticipated that pedestrian and bicycle trips will continue to be an important mode of travel in, through and out of Union Square by future residents and workers, and encouraging these modes of travel is important for balancing the impacts on transportation infrastructure.

In addition, the mode share percentages were determined through coordination with the City. The focus of these mode share percentages was to reduce vehicle trips and encourage other modes of travel, whether they be transit, walking or bicycling. The goal of the Project's required monitoring programs that will be implemented for each Lot will be to continue to evaluate these mode share percentages, with the goal of reducing vehicle trips, and appropriately identify potential mitigation and programs that may be needed to further reduce vehicle trips. The City and US2 are anticipated to continue to work with the MBTA as the GLX operations mature to identify any improvements to Green Line service and/or bus service to ensure that transit service appropriately meets demand.

Although alternative analyses with different mode shares would change the transportation analysis, US2 believes that the results of such an analysis would not provide information that can inform future conditions and potential mitigation, as the analysis would not be consistent with agreed upon goals outlined with the City or currently anticipated transportation habits.

USNC.8 **More detailed analysis of bus waiting times and methods to solve issues such as bus bunching, which significantly increase wait times, exposing people to the weather elements.**

US2 understands the concerns raised about bus bunching and wait times. Although US2 does not have the ability to control bus operations, US2 will raise these concerns with the City for their use in continued coordination with the MBTA regarding local bus operations. The MBTA is currently undergoing evaluations of bus services throughout its system to identify areas in need of improvement. The bus evaluation in the DEIR provided information to the MBTA regarding bus service through and adjacent to Union Square, and it is anticipated that this information will help inform the MBTA regarding issues of concern in the area, and areas where additional operational efficiencies may be required.

As described in Section 2.5.3, subsection MBTA Bus Service Mitigation, at the request of MassDOT and MBTA, US2 completed a focused analysis on MBTA bus service using a new methodology developed by the joint MassDOT/MBTA OPMI. The emphasis of this analysis was to review the overall impacts of Project-generated trips, through the course of a day, relative to the Comfort Metric established through the MBTA's Service Delivery Policy.

Section 2.5.3, subsection MBTA Bus Service Mitigation, provides a description of potential interventions to improve MBTA bus service in the Study Area. The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts. The City has both the ability and the willingness to attempt additional interventions to benefit transit. The City may use the overall transportation mitigation and investment dollars provided per US2's development agreement to implement roadway changes. In addition, through the individual plans for each Lot, US2 will work with the City on potential transit

improvements proximate to each Lot. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger operations within Union Square and will be used to help determine future improvements or the success of ones previously implemented.

Further, as a condition of its master plan approval, US2 committed to improving the accessibility and comfort of existing bus stops that are located on Project Lot frontages (i.e., six existing bus stops located on Lots D1.2, D3.1, D3.1, D4.3, D6.2 and D7.2).

As plans are submitted for each Lot, US2 will work with the City and the MBTA on the location, potential improvement and design of bus stops per the then current MBTA plans and City and MBTA design guidelines. This process is underway for the bus stop on Prospect Street proximate to Lots D2.1, D2.2, and adjacent to the future Union Square Station.

USNC.9 **It appears that the DEIR traffic signal operations have unusually low WALK times and unusually low delay times, far below the minimum times set by the Manual for Uniform Traffic Control Devices, a Federal document fully accepted and applicable to Massachusetts. Additionally, there is no description of the formulas used to estimate delay and how the number of lanes and the crossing volumes enter into the delay estimate. The estimates also do not include whether the crosswalk is "exclusive WALK" or "concurrent WALK". The Final EIR must include proper documentation of their calculations, with increased WALK times and decreased cycle lengths at signalized intersections.**

The Project is consistent with and derived from Somerville's recently completed Union Square Neighborhood Plan. The Neighborhood Plan sets a vision for Union Square and the Project based on community-based values. This includes a very intentional approach to mobility and transportation management that privileges pedestrians, transit riders, and cyclists over vehicles to create a walkable, vital employment center. Increasing mode-share and "throughput" for non-auto modes over auto modes is central to this goal.

Section 2.1 describes the methodology used to determine the PLOS analysis included in the DEIR. The methodology comes directly from the HCM published by the TRB. The PLOS for signalized intersections follows the methodology detailed in Chapter 18 of the HCM, and the unsignalized intersections follow the methodology detailed in Chapter 19 of the HCM. These methodologies are industry standards backed up by years of research by TRB. It should be noted that adjusting the walk times to the maximum pedestrian interval length at each intersection provided no significant changes in the overall PLOS score and did not affect the PLOS of the intersections.

Section 4.5.2, of the DEIR provided potential intersection modification elements to improve pedestrian delay and safety as pedestrian volumes grow. The City will be informed of pedestrian operations through the annual monitoring to be completed by US2. Modifications to traffic signal timing and other pedestrian facilities can be completed on an ongoing basis at appropriate times by the City, with support of US2.

USNC.10 **The locations with the most bottlenecks require more detailed analysis showing full final phasing, pedestrian crossing times, and effects of short lanes.**

The DEIR (Section 4.5.5.5 and Appendix B) provided intersection capacity results for all study area intersection for the 2025 Build Condition for the a.m., p.m., and Saturday peak periods and is consistent with standard TIA guidelines. As discussed in the DEIR, several intersections are slated for design or upgrade by the City as part of the continued implementation of the Neighborhood Plan and other ongoing initiatives. The City will complete robust design processes for each, including reviews of alternative signal phasing and geometric phasing per the then current guidelines and transportation information.

USNC.11 **Impacts from increased traffic through Union Square will be significant, as recognized by the Proponent and pointed out by numerous comments to the Executive Office of Energy and Environmental Affairs (EEA). Parking garages should be placed away from first floors near sidewalks and pedestrian areas as much as possible. As stated above, underground parking should be promoted as much as possible. Air quality in new buildings will be a big issue given that levels of congestion at major intersections. All buildings should be built with the best available technology of the moment to mitigate indoor air pollution (LEEDv4 BD+C has a minimum indoor air quality performance requirement for certification; however, that doesn't include air filtration systems).**

Vehicular entrances to each of the parking garages will be located off of the pedestrian streets to minimize the number of points of pedestrian and car intersection. The proposed parking garage locations were selected as part of the master planning process to maximize the opportunity for shared parking, thereby reducing the number of parking spaces that would be required in connection with the development of the Project. The largest parking facilities were located on the largest Blocks (D1, D2 and D3) and at the edge of the neighborhood in order to 'intercept' cars and reduce vehicle trips through the heart of the neighborhood. Each of the parking structures that are located on designated pedestrian streets (i.e., Washington Street, Somerville Avenue, Prospect Street, Bow Street and Webster Street) will be lined with non-parking uses to ensure a vibrant and pedestrian friendly streetscape. Please refer to USNC.5 and USNC.6 for responses related to underground parking garages.

US2 will consider indoor air quality measures as part of its process related to its commitment to LEED certifiability within the Project (i.e., LEED Gold on buildings greater than 50,000 sf and LEED Silver on buildings less than 50,000 sf).

USNC.12 **The FEIR should more thoroughly analyze the use of more energy efficient and climate resilient building standards, especially for buildings that are planned in the years to come.**

The FEIR contains details of the proposed Project's energy efficient and climate resilient building designs, including all better-than-prescriptive code level building envelopes. A thorough evaluation of electric systems has been included. While the anticipated lab uses in a number of proposed buildings make a Project-wide commitment to all-electric systems impossible, electric systems are anticipated to be incorporated in the Project where appropriate and financially viable. This will ultimately depend on the tenant mix of each building. Please refer to Section 3.3 for an analysis of electric systems including GHG reduction benefits and cost paybacks.

Additionally, this FEIR contains a thorough Passive House analysis of the multi-family and high-rise residential buildings. Please refer to Section 3.4 and Appendix E for details. Passive House will be considered for all residential buildings built in Phases 2, 3-South and 3-North. Passive House principles are proposed in current designs across Union Square.

Provided its unique suitability, and prime location near the future Union Square Station, US2 will commit to delivering the multi-family building on D4.3 as a Passive House project. Please refer to Section 3.4 for details.

USNC.13 **Mitigation contingency plans should be prepared to account for possible higher levels of contamination on all planned development sites.**

Additional environmental assessment activities are anticipated to be performed at or shortly before US2 acquires the properties and prior to site redevelopment activities. The additional environmental assessment data will be evaluated in connection with any existing data and incorporated into the applicable construction Release Abatement Measure (RAM) Plans that will be submitted to MassDEP, as required, prior to construction. RAM Plans will include provisions for perimeter dust and/or air quality monitoring, if warranted based on the data, to protect against contaminant migration. Additionally, redevelopment activities will be performed in accordance with all applicable local, state, and federal regulations.

Secretary, Matthew A. Beaton
Attn: MEPA Office, Alex Strysky
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

March 1, 2019

Via email to Mr. Alex Strysky
RE: **EEA#15889, DEIR, Union Square Redevelopment, Somerville MA**

Dear Secretary Beaton,

Thank you for allowing commentary on the Draft Environmental Impact Report submitted by the proponent, US2. Before granting a certificate to the proponent, I would ask that the following concerns be addressed. I am speaking in opposition until they are resolved.

The first is the location of the public plaza along Prospect Street. From now perhaps until all the D-parcels are delivered, the traffic along Prospect Street will be bumper to bumper during the six hours of rush hour traffic that clogs the city during the am and pm. The plaza is designed for passive and active use with café's, outdoor seating and pleasantly landscaped areas that encourage people to linger. All of these elements are desired in our civic spaces, but not in this location. The studies of the dangers of particulate matter from traffic and rail have concluded that diseases cardiovascular, asthma, autism, Alzheimer's such as and increased mortality are directly linked. I don't want the placement of this heavily use plaza to remain in this location. I would like the proponent to considered the alternative design proposed by Tim Talun. Whether the plaza remains here or no, I would like air quality sensors to be placed in each civic space. Nels Nelson who works as a consultant to US2 has expertise in the installation of these air quality sensors. His knowledge should be taken advantage of. TA.1 TA.2

That the Chapter Five Air Quality analysis is only three pages long seems to be a cause for concern given the impact the traffic pollution will have on the human health and quality of life. What is the recommended maximum exposure to air pollutants and particulate matter? Why is this section only three pages? TA.3

Another concern is the lack of reaction or feedback from the hard-worked D2 station design put forth by community member Tim Talun. There was a plan for US2 and the city to present to the community the peer reviewed cost estimate of the underground parking, so that we could see what we needed to create the preferred community design. The meeting has been rescheduled twice. The next date is for March 6th. The cynic in me says that if the project is certificated then there would be no reason for US2 to follow through with further researching the potential to implement the community design. I would like some commitment from US2 that they will do everything they can t put at least some parking underground to create more open space that is more connected with the heart of the square. TA.4

A disservice in this project is the lack of easy ADA access to the T-platform from the south side. From the first southernmost access point (stairs), there is 900 ft to the ADA entrance at Somerville Ave and Prospect. If one is in need of ADA access, either with a wheelchair, stroller etc., one must go down the

hill and then back up it to get to the station. There needs to be direct vertical access from the Prospect Street bridge to the T. An elevator would be appropriate here. TA.5

In the transit analysis, I was trying to find the impact of on-demand car ride services like Lyft and Uber on traffic in Union Square. I wonder how much these services will increase the traffic in Union Square, and around the T station. Personally, I would like to see some analysis done. Maybe there is no impact, but the convenience of these services and the increasing frequency with which I see them seems to have a negative impact on traffic and public transportation. We need counter efforts to mitigate this. Perhaps this is something that can be included in the Mobility Management Plan. TA.6

As a citizen activist, I appreciate your oversight and desire to work with the community, the MBTA, the city and the developers on creating a square that will be able to accomplish its vision of a sustainable, dense, climate forward, and clean transit-oriented city.

Please do not issue a certificate to the proponent until the above problems and the ones brought up by informed activists and scientist are addressed.

Sincerely,

Tori Antonino

65 Boston Street

TA.1 Location of Plaza on D2.

The proposed location of the D2 plaza was arrived at through a lengthy public review and planning process, including the process that resulted in the approval of the CDSP. This extensive process included multiple rounds of neighborhood and stakeholder meetings, multiple public hearings, review by planning staff and the Planning Board, and approval of the CDSP, which specifies that the plaza on D2 be located along Prospect Street, where it lines up with the long-planned entrance to the future Union Square Station. The approval of the CDSP followed earlier extensive planning efforts that resulted in *SomerVision* and the Neighborhood Plan, again with many public meetings and hearings.

The D2 plaza is part of the initial Project phase, and since the ENF was filed US2 has been refining D2's design through the City's DSPR process. As part of the D2 planning process, notwithstanding the fact that the location of the D2 plaza was previously evaluated and approved as part of the CDSP process, certain community members suggested that the design of the plaza should be significantly revised in light of concerns regarding pollution impacts from vehicles on Prospect Street. More specifically, these members of the community suggested that US2 consider an alternative plan that would require a significant reconfiguration of the D2 design, an amendment to the CDSP, to accommodate a proposal to move the D2 parking structure underground, situate the plaza in the center of the D2 site and locate a building between Prospect Street and the plaza. It was suggested that this reconfigured design would serve to minimize certain vehicular pollution impacts on users of the plaza.

As noted in the DEIR, US2 has studied the community proposed alternative, evaluated 'pros' and 'cons', and estimated the cost of the underground parking solution. One of the 'cons' identified was that the revised plaza location is not centered on the pedestrian access to Union Square Station, and the reconfiguration would require pedestrians accessing the station via the 'at-grade' accessible route to travel further. The reconfigured design would also result in making the plaza area less visible from the street, potentially creating concerns about whether users of the space would perceive it as secluded or unsafe.

To further understand the alternative design proposed by certain members of the community, the City hired a third-party construction estimating consultant to estimate the cost of the alternative and some variants. Ultimately, the premium cost of the alternatives was cost prohibitive. The Project is not able to absorb the additional cost, in addition to all of the other Project benefits outlined herein, and remain financially viable. Project feasibility is further challenged by increased risk, significant schedule delay and design challenges associated with implementation of the alternative plan.

Given the challenges associated with moving the parking underground on D2, and the infeasibility of that approach, which would result in significant delays and substantial costs, US2 revised the civic open space design in other ways to make it more resilient to vehicular pollution impacts. The width of the D2 civic open space has been increased to create greater horizontal separation from the civic open space areas most likely to be populated by pedestrians to Prospect Street vehicles. The elevation of the plaza has also been set at approximately the same elevation as the adjacent Union Square Station, allowing the southern approximately 150 feet of the plaza to benefit from being more than seven vertical feet below Prospect Street. The largest portion of the plaza, where people are most inclined to congregate, is at the southern end of D2 and benefits from the most vertical separation from Prospect Street (approximately 10 to 14 vertical feet). A vegetated landscape buffer has also been planned between the Prospect Street sidewalk and the main pedestrian areas of the plaza to further separate main pedestrian areas on the plaza from vehicles. Additional information regarding the D2 civic open space can be found in Section 1.2.4.4.

TA.2 **I would like air quality sensors to be placed in each civic space.**

As noted in Section 1.2.4.4 and in response to comment USNC.3 above, US2 revised the approved CDSP civic open space design to make it more resilient to vehicular pollution impacts. The width of the D2 civic open space has been increased to create greater horizontal separation from the civic open space areas most likely to be populated by pedestrians to Prospect Street vehicles. The elevation of the plaza has also been set at approximately the same elevation as the adjacent Union Square Station, allowing the southern approximately 150 feet of the plaza to benefit from being approximately seven vertical feet below Prospect Street. The largest portion of the plaza, where people are most inclined to congregate, is at the southern end of D2 and benefits from the most vertical separation from Prospect Street (approximately 10 to 14 vertical feet). A vegetated landscape buffer has also been planned between the Prospect Street sidewalk and the main pedestrian areas of the plaza to further separate main pedestrian areas on the plaza from vehicles.

If the City plans and implements an air quality monitoring program throughout portions of Somerville, US2 will coordinate with the City to identify locations within the Project's civic open spaces and make them available for data collection.

TA.3 **Air quality analysis in DEIR.**

The air quality analysis included as Chapter 5 of the DEIR was a mesoscale analysis which was required by the MEPA Certificate and requested by MassDEP, and was prepared using methodology prescribed by MassDEP. The methodology is consistent with that used for similar projects within the Commonwealth. The mesoscale analysis discloses the nitrous oxides (NOx) and volatile organic compound (VOC) emissions predicted to be created by the new vehicle trips created by a project, and is provided in order for MassDEP to

determine if the emissions are consistent with the State Implementation Plan, which is the Commonwealth's stated approach to ensuring that the concentration of air pollutants do not exceed the National Ambient Air Quality Standards. Additional air quality analyses recommended by the commenter would go beyond the scope of the DEIR.

TA.4 **I would like some commitment from US2 that they will do everything they can to put at least some parking underground to create more open space that is more connected with the heart of the square.**

The Project master plan includes the provision of underground parking on portions of D1, D3 and D6 where below-grade parking appears feasible. Soil contamination, water table location and soil conditions all influence the feasibility of underground parking. Most of the parking garages proposed within the Project master plan are located below the footprint of proposed buildings. Therefore, relocating those parking garages underground will have minimal impact on the amount of open space provided. For additional information regarding the considerations related to underground parking, please see the response to comment TA.1.

TA.5 **There needs to be direct vertical access from the Prospect Street bridge to the T. An elevator would be appropriate here.**

US2 agrees that vertical access from the Prospect Street bridge to Union Square Station is important to MBTA patrons accessing Union Square Station from the south. In order to contribute to improving circulation from the station to the Prospect Street bridge, US2 has offered to amend the D2 design to provide, at no cost to the MBTA, easement rights on the D2 property as required to make way for the MBTA elevator and/or to install a stair adjacent to the MBTA elevator location. US2 has also offered to contribute to the cost of the MBTA elevator's installation. US2 will continue to coordinate with the MBTA, the City and other stakeholders on this issue and remains hopeful that a solution for the MBTA elevator can be identified.

TA.6 **In the transit analysis, I was trying to find the impact of on-demand car ride services like Lyft and Uber on traffic in Union Square. I wonder how much these services will increase the traffic in Union Square, and around the T station. Personally, I would like to see some analysis done.**

As stated in the DEIR, page 4-42, "recent vehicle volumes collected by the City of Somerville at multiple intersections demonstrated a lack of growth, and/or a decline in vehicle counts" in and around Union Square. The transportation information collected does not distinguish vehicles by type (other than heavy vehicles). As part of the surveys to be completed of Project tenants through the Annual Monitoring program, the Project will be able to identify the extent of transportation network company (TNC) usage as reported.

Secretary Matthew Beaton
Executive Office of Energy & Environmental Affairs
Attn. MEPA Office
100 Cambridge Street Suite 900
Boston, MA 02114

Dear Secretary Beaton,

Please find below my request that you require a supplemental report from the applicant on the Union Square (Somerville) Redevelopment **DEIR – EEA No. 15889.**

Union Square Station Associates (US2) has failed to present a credible, lower density alternative project for evaluation and inspection by all stakeholders. Instead, they introduce a slightly reduced project, then dismiss the lessened environmental impacts as insignificant and not worth the loss in revenue to the city's tax coffers. A real lower density alternative would be at least 15-20% less dense than the preferred project plan. Until the applicant presents one, the DEIR is incomplete.

There appears to be an assumption that all the applicant has to do is subtract some square footage and then said plan can be used to measure the lesser environmental impact. This is not true. A real lower density alternative would reveal how different mix of uses, lower square footage, and different design parameters alter the benefits and problems to the environment.

In addition, US2's consultants continue to throw up their hands saying that there are no solutions for some of the problems, or that they require regional solutions. By doing so, they make a case for why a lower density alternative should be examined in detail.

We can do better than a modal split of 22% for transit use. Instead of waiting for this dismal number to actualize, the developers must commit to concrete efforts to aim higher...to at least 30-40%. Instead, US2 will wait for the traffic counts to spell out what we already know; that gridlock will get worse and air pollution will dramatically increase. The community has repeatedly asked for traffic counts every six months, not every year. The community has rejected the plan for 1,500 parking spaces in multi-story structures, with a potential for even more by Special Permit. Incentives for transit, bike, and other modes should be implemented right away. BC.1

We can do better than studying and providing access for green roofs, solar panels, passive house design and recycling. We know these efforts are essential for Somerville to reach established goals for net zero and a diminished carbon footprint. If they are not implemented in transformational developments such as this one, one wonders where will they be implemented. BC.2

I hope that the Secretary will require a supplemental report to accomplish the goals set out above.
Thank you for your careful consideration of my request.

Sincerely,

Bill Cavellini, Co-Chair
Union Square Neighborhood Council
33 Oak Street
Somerville, MA 02143

BC.1 **We can do better than a modal split of 22% for transit use. Instead of waiting for this dismal number to actualize, the developers must commit to concrete efforts to aim higher...to at least 30-40%. Instead, US2 will wait for the traffic counts to spell out what we already know; that gridlock will get worse and air pollution will dramatically increase. The community has repeatedly asked for traffic counts every six months, not every year. The community has rejected the plan for 1,500 parking spaces in multi-story structures, with a potential for even more by Special Permit. Incentives for transit, bike, and other modes should be implemented right away.**

The DEIR included an error that mistakenly identified the auto mode share as 38.8%; the current journey to work data for the area around Union Square shows that the non-auto mode share is 38.8% and the auto mode share is 62.2%.

US2 agrees that transit mode share is an important factor in minimizing vehicle use. However, the share of pedestrian and bicycle trips is also an important factor, as not every individual is travelling longer distances that are best done by transit. It is anticipated that pedestrian and bicycle trips will continue to be an important mode of travel in, through and out of Union Square by future residents and workers, and encouraging these modes of travel is important for balancing the impacts on transportation infrastructure.

In addition, the mode share percentages were determined through coordination with the City. The focus of these mode share percentages was to reduce vehicle trips and encourage other modes of travel, whether they be transit, walking or bicycling. The goal of the Project's required monitoring programs that will be implemented for each Lot will be to continue to evaluate these mode share percentages, with the goal of reducing vehicle trips, and appropriately identify potential mitigation and programs that may be needed to further reduce vehicle trips. The City and US2 are anticipated to continue to work with the MBTA as the GLX operations mature to identify any improvements to Green Line service and/or bus service to ensure that transit service appropriately meets demand.

Although alternative analyses with different mode shares would change the transportation analysis, US2 believes that the results of such an analysis would not provide information that can inform future conditions and potential mitigation, as the analysis would not be consistent with agreed upon goals outlined with the City or currently anticipated transportation habits.

The schedule for the annual Traffic Monitoring Plan was determined through coordination with the City and will be sufficient to ascertain changes in travel volumes or patterns. The approved Union Square Zoning Overlay District includes a carefully considered parking policy that requires a shared parking strategy, permits a maximum of 1,500 total parking spaces, and has no required parking minimum ratios. The proposed

Project and its mobility management approach is responsive to this policy and includes 1,495 proposed parking spaces. The proposed parking levels are based on developing a mix of Project uses, operating shared parking facilities and the parking management strategy outlined in the DEIR. Please see Section 4.5.6 of the DEIR for more information regarding the parking plan, and Section 2.3 of the FEIR for more information regarding the shared parking model.

The DEIR also included an unshared parking analysis that was completed using the ITE Parking Generation manual, 4th edition. A summary of this analysis was included in Appendix B-8 of the DEIR, and shows that the potential demand if parking were unshared and not managed as described in the DEIR, could be over 4,800 parking spaces. The parking ratios proposed for the Project are below transportation industry standards.

In an effort to encourage a higher rate of shared vehicle use, the Project will provide approximately 14 of parking spaces dedicated to car sharing, and US2 has agreed to provide additional incentives for car sharing services for every residential unit.

Incentives related to the Project's TDM program will be implemented in phases as the Project is built-out. These programs are planned to coincide with the development of each Lot to ensure the appropriate programs are effectively implemented for the appropriate uses. Please refer to Section 2.4 for more information about the approach to transportation mitigation and monitoring.

BC.2 **We can do better than studying and providing access for green roofs, solar panels, passive house design and recycling.**

US2 has proposed additional measures in the FEIR to improve the GHG performance of the Project. US2 has committed to building D4.3 as a Passive House multi-family project. Please refer to Section 3.4 for details. Additionally, the Project has committed to reserve a minimum of 40,000 sf of rooftop area for future photovoltaics.

See Chapter 3 for additional information about the GHG analysis and Section 3.8.3 for the related mitigation comments.

Stephen H. Kaiser
191 Hamilton St.
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To : Sect. Matthew A. Beaton Executive Office of Energy and Environment
Attn: MEPA Office, Alex Strysky

From : Stephen H. Kaiser

Comment on Draft EIR for Union Square EEA # 15889

The comments below are submitted as a review of several chapters and appendices of the Draft EIR. They are not a full review of the entire document, which at 2,500 pages in length, may be beyond human capabilities to fit into a standard 30-day MEPA review.
The extension of the comment period by one week is appreciated. The primary focus of my comments will be on transportation and drainage/wastewater.

The transportation scales of the ENF and EIR appear equivalent, with the most notable similarity being the 22% transit mode share. Current trips to Union Square have an auto mode share of 38.8% (p. 4-7) The future auto mode share actually rises to 40% for the new development – <u>even with new Green Line transit service in place</u>. All past promises have assured us that transit would be a vital stimulus to development and density, while reducing auto-dependence and congestion in the streets. According to this DEIR, nothing of the sort has happened. The new transit service has been ineffective. Auto trips have risen, not fallen, as a result. SK.1

How could this have happened? How did the transit ideal disappear? Can the dream be rescued? These are all fundamental issues that need to be resolved as soon as possible.

The proper focus for the answers to these questions lies in an improved consideration of <u>alternatives</u>. The new focus should not be based on <u>land-use</u> in the manner of Chapter 2, but instead should be focused on <u>transit alternatives</u> and their effectiveness.

TRANSIT ALTERNATIVES ANALYSIS

Something clearly has gone wrong in the DEIR if transit ridership, both rail and bus, is only 22%. A proper consideration of transit alternatives would allow for a total project that would generate more transit trips, fewer auto trips, and have an improved pedestrian environment. Parking garages could be much smaller in scale, with an emphasis on shared vehicle use. None of these objectives have been achieved in this EIR. SK.2 SK.3

It is important that revisions to the EIR should focus on transit : both past incorrect images of what transit can be expected to do and what transit can really do -- if designed and operated imaginatively. A new mindset should identify the ways to assure that the Green Line branch to Union Square operates effectively .... provides improved high-quality transit service .... and does not overload any other part of the Green Line system.

Furthermore, Somerville's historical advocacy for the Green Line should be supported with added analysis to guarantee that the City's plans for up to seven million square feet of new development will be handled successfully into the future, without increasing congestion on Somerville Streets. Improved transit should become the practical backbone for truly sustainable planning and development within the City. The practical answer is not more highways and street capacity. It is in serious, practical and productive transit. If street congestion can be reduced, buses can be part of that overall transit service program.

As unsatisfactory as the particulars of transit planning have been in the past, a new transit functionality should be possible at a relatively small capital cost, with the cooperation of the City of Somerville, MassDOT, the MBTA and the residents.

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The transit alternatives should include as a minimum :

* a 22% transit share, with 40% auto share, as described in the Draft DEIR. Auto trips would be almost double transit trips. The Green Line would be limited by capacity constraints in downtown Boston. Union Square would not be "Transit Oriented Development" but would instead continue to be traditional auto-oriented and transit-limited development .
~~~~~~~~~~~~~~~~~~~~~~~~~~

* a 40% transit share, and 30% auto share. Green Line capacity would be expanded to allow for almost a doubling of expected trips to Union Square. Incentives and design features on-site would be adapted for less auto ownership, more vehicle sharing, and application of feasible and effective TDM practices.

* a 60% transit share and 15% auto share. A full range of enthusiastically planned transit programs for both bus and rail would be implemented as cities should properly be, without excessive dependence on cars and their storage. Any increase in transit capacity should cause some auto drivers to abandon their cars and use transit instead, thus reducing congestion on local streets. Ultimately, this option is the only sustainable future for Somerville in dealing with the impacts of the automobile in the city.

These three alternatives are based on three different outlooks towards transit : apathetic .... energetic .... and enthusiastic. The DEIR alternative would represent an unimaginative view towards an already overloaded and under-performing transit line. Current service frequencies would be maintained, plus added ridership from GLX, but would contain no provisions for increased capacity to handle the added new ridership.

The second alternative (40% transit) would expand the energy of our imagination to consider significant improvements in Green Line capacity through primarily operational improvements. Transit ridership would increase significantly, but added auto trips from new development would still contribute to local street congestion.

The third alternative (60 % transit) requires great imagination to have Somerville benefiting from quality transit service, when for years it has suffering from rail service that stops short of the city (Lechmere), skirts the edges (Fitchburg commuter rail and Davis Square), or travels through the city without stopping (Lowell and Haverhill lines). Instead, Union Square would resonate with a positive dependency on transit. This transit alternative includes the changes to transit service that work effectively, and provide the necessary capacity. This alternative says loudly and clearly : Better transit service has the best potential to absorb new trips from development, while roads and cars do not.

This DEIR offers little more than a description (and acceptance) of existing service. With nothing more than a 22% transit mode share, Union Square becomes a symbol

of modern transit investment that fails to deliver on its planning promise. It is difficult to see why federal transit officials would look kindly upon future transit grants to the MBTA, if their $1 billion contribution to the Green Line cannot deliver better service to Somerville.

MassDOT also made a similar commitment and dedication to the promise of GLX when in the fall of 2015 the MBTA investigated management, financial and design inadequacies in the in the GLX joint venture team. The old team was fired, and a new team was hired to restore the project to viability. A new project manager was brought in from Chicago to provide essential leadership. The effort reflected a major investment by MassDOT to restore the promise of Green Line transit.

A 22% transit mode share means in essence that almost 80% of the trips to the Union Square development will be made by people who choose car, bike or walking – and do not choose transit. In modern urban planning terms, such a result is tragic and disastrous.

Alternative #1 would mean there is no way to allow for future development without overloading local streets. One traffic alternative is not to do the development in the first place. We should do better than use the MEPA process to simply document traffic failures.

If this development and its transit assumptions result in local street traffic failure, what advantage is there to this developer and the 22% transit assumption? What chances does Union Square have for not being identified as Somerville's equivalent of Cambridge's Alewife area and its peak hour traffic congestion -- the worst in Cambridge and Somerville? It should be in the financial interests of this developer to seek transit solutions for Union Square.

ISSUES OF TRIP GENERATION

New forms of trip generation and modal splits should be an inherent part on the consideration of new alternatives. The problem with modal splits in the DEIR is not the source of the data (ITE Trip Generation Manual, 10th edition) p. 4-4. Losing the goal of transit oriented development comes from the quality of transit service offered, and the goal can be resurrected by providing better transit service. The problem with modal split in this EIR does not appear to be any anti-transit bias on the part of traffic engineers of the

developer. The challenge for this developer is to show that his development can work and do so by identifying ways to improve the quality of Green Line service. The alternative is a smaller project.

MEPA must develop an appropriate definition for Transit Oriented Development. Otherwise it will be possible for any project with a bus line a block away to be claimed as TOD. Absence of adequate transit capacity usually implies that any project close to a transit line cannot automatically claim to be"transit oriented." With congested transit service, the result may displace existing transit riders and yield no net increase in new transit riders.

I prefer a definition of TOD whereby new transit trips exceed new vehicle trips. When transit trips are less than vehicle trips, this should not be seen as Transit Oriented Development. The Final EIR should offer a credible working definition of TOD and then modify the Union Square project to match those objectives.

In summary : for the above transit scenarios, Alternatives #2 and #3 above are TOD .... Alternative #1 is not.

WAYS to MEASURE and INCREASE TRANSIT CAPACITY

MEPA has developed a set of Guidelines for the preparation of EIRs, dating back to the late 1980s, to address traffic impacts on state highways from new development. Unfortunately, no similar guidelines were developed for transit, pedestrians and bikes in cities.

Much work needs to be done to recognize ways to measure capacity and service for mass transit. EIRs typically do not demonstrate the potential for improvements in transit performance service. MEPA needs to develop guidelines to assess the capacity of mass transit in urban areas, especially when the road system offers little opportunity for increases in traffic capacity. These guidelines should describe methodology for assessing transit capacity, including level of service, delay, and relation to pedestrian circulation. With the recent popularity of bus lanes, a mixture of traffic and transit analysis needs to be applied to capacity and delay (or time saving) for bus operations. The Final EIR for Union Square should initiate the process of looking into the capabilities of bus lanes around Union Square, and assessing their capabilities. SK.4

In assessing transit capacities, the traditional experience of New York City for single track capacity has been recognized as 40,000 passenger an hour. This figure was achieved years ago when the Metro was operating more effectively than it does today. By comparison, the most recent peak load count of the Red Line indicated a movement of 8,600 passengers at the peak load point in Cambridge. In other words, the Red Line is moving only 23% of the passengers per track that New York transported in its heyday. Like a 22% mode share, the capacity figures on the MBTA are embarrassingly low. MEPA should be adopting transit capacity criteria to guide future EIRs for true Transit Oriented Development.

The historical experience with the Red Line is valuable for Somerville and Union Square. Schedules peak hour headways are 4.5 minutes or 270 seconds. During World War II when a priority was placed on excellent transit service during wartime emergencies, trains operated into Harvard Square with headways of 90 seconds. In other words, trains were running three times as frequently. The Red Line actually has the potential for a tripling in capacity. Understandably, the MBTA discourages such discussions.

Given its 9 mph average speeds and congested operations, the Green Line should be investigated for similar historical situations when trains ran more frequently. The 1911 schedule for trolley service into Park Street identified 316 trolley cars an hour approaching from Boylston Street. Average headways were eleven seconds. Present day schedules at Park Street give Green Line service on 90-second headways. In other words, rail cars coming into Park Street occurred eight times more frequently than today. The capacity calculation is more complicated, but the 1911 schedules suggest that better service through Park Street was not only possible in 1911 but it was also achieved and placed into a schedule as a form of service guarantee to the transit rider.

Both the Red Line and Green Line comparisons with historical performance suggest strongly that major improvements in capacity are possible for the Green Line, and that the changes are primarily operational in character. During 1911 and the Second War the systems operated with relatively simple technology, no computers and no artificial intelligence. I am not suggesting a high technology solution. Simply find out how the old timers did it and repeat their methods.

In almost all transit studies, the capacity analysis for buses is minimalist in substance. MEPA needs to define specific performance standards for buses. The DEIR includes a partial effort to consider bus comfort when the rider is aboard. This approach ignores the most uncomfortable part of the bus journey : waiting at open bus stops under difficult weather conditions. Bus evaluation methods should account for average waiting delays when buses arrive on time, and also account for headway variations commonly called bunching. Bunched buses physically operate one behind the other, with the result being longer waiting delays. Running two buses one behind the other can double such delays.

The developer should review Chicago's experience with identifying bunching incidents and seeking to respond. Chicago does recognize bus bunching, In contrast, bunching studies are almost unheard of within the Boston area. SK.5

Clearly, there is a need for transit mitigation by one or more parties, including planning. Specific actions for better transit service will be discussed further at the end of this comment in response to Chapter 13 on mitigation.

GOOD PLANNING FOR UNION SQUARE

Good planning for Union Square begins with good planning by the City of Somerville, and the DEIR includes a concise description of past studies. Thus much planning work has been done to precede this EIR. A mobility management plan has the goal to reduce the emphasis on vehicle travel and to "*increase the attractiveness and practicality of other modes of transport, while reducing the demand for and use of cars.* " (p. 1-32)

In 2012 the City prepared the Union Square Revitalization Plan and urban renewal Revitalization Plan. It *"assessed the unique opportunities provided by the Project's seven designated development Blocks in light of the potential MBTA transit (i.e., the GLX) coming into the area. The transformative impact of transit factored heavily in the determination of a redevelopment scope of approximately 2.3 million square feet."* (p. 2-2)

The Project Plan for Union Square prioritized "*a more walkable environment that is less dependent upon cars and parking. A variety of transit modes will be employed that*

reduce environmental impact and create a healthier community by encouraging non-auto trips." The plan recognized that "there will be impacts to the transportation network and many of these were anticipated in and accounted for in the Neighborhood Plan, and were integrated in the City's planned transportation improvements." (p. 4-2)

The Neighborhood Plan includes "*a very intentional approach to mobility and transportation management that privileges pedestrians, transit riders, and cyclists over vehicles to create a walkable, vital employment center.*" Increasing mode-share and 'throughput' for non-auto modes over auto modes is central to this goal.

The DEIR recognizes that the policy established in the City's Complete Streets study to advance "*a pedestrian-first modal hierarchy. All transportation projects and programs, from scoping to maintenance, will favor pedestrians first, then transit riders, cyclists, and motor vehicles. This implementation approach will rebalance Somerville's streets to make them more 'complete', reversing generations of auto-mobile focused planning and design at the expense of all other transportation modes.*" (4-1) The DEIR recognizes all of these objectives.

PLANNING FOR TRANSIT AND BICYCLES

These pro-pedestrian concepts were expanded to include transit and cyclists : "*Collaboration with the City and an understanding of their transportation goals has resulted in the Proponent's investment in transportation improvements and mitigation being largely focused on expanding access and infrastructure for transit, pedestrians and cyclists, and efforts to reduce vehicle trips*." The planning technique to achieve this goal was Mobility Management Plans (MMPs) that are "*proactive measures that will be enforceable through the Project's permits and combine to help achieve the non-auto mode share goals for the Project. The Project's MMPs will require the Proponent to advance progressively more aggressive Transportation Demand Management (TDM) programs as needed to achieve these goals.*" (p. 4-2)

"*The Proponent and City understand that additional transportation-related mitigation may be necessary.*" (p. 4-2) Indeed there are. For many transit improvements it will take the City and developer pointing out the improvements that can be made, and the MBTA implementing them.

PEDESTRIAN PLANNING FOR UNION SQUARE

The Somerville planning studies and text in Chapter 4 on Transportation should have illustrated how the City would implement its policy of priority placed on "*pedestrians first*." To achieve this goal the DEIR presents a new method to highlight pedestrian delays when crossing intersections, and how to measure a pedestrian Level of Service. The analysis shown is lengthy and generally clear and detailed, extending as Figures 4-11 through 4-17 (pp. 4-43 to 4-94). Its analysis is "*more expansive than those typically included as part of a MEPA filing, and thus were included here after consultation with MassDOT.*" Detailed pedestrian counts in excellent format were included in the EIR.

Up to this point the planning and priorities for pedestrians has been well established in Somerville planning and in the analysis methods selected by the developer for the EIR. At this point, everything seems to fall apart.

Figure 11 begins with a listing of key signalized intersections, including such factors as cycle length, WALK time, pedestrian delay and pedestrian Level-of-Service. Six of the locations have WALK times LESS that the MINIMUM allowed by the Manual on Uniform Traffic Control Devices (MUTCD). This same pattern continues for the year 2025 locations. The obvious question is this : WHY are WALK times now and in the future set below the minimum allowed in MUTCD, if the prevailing policy is "pedestrians first" ? SK.6

On the surface, the result appears to be the urban advocates worst example of interventions by unthinking traffic engineers. Given all of the planning that has been done, how could it have happened? It could have been that the error was indeed innocent, of an unthinking kind. The result is the same, a sacrifice of available crossing time by giving more time to cars and less time to pedestrians -- a typical decision made by traffic engineers.

While the format for pedestrian delay contained in Tables 4-11 to 4-17 is excellent, all calculations of delay lack credibility. On the right-hand side of the calculation sheet below, I have included my calculations for simple delay using data from Table 4-11 (Existing AM Peak), to cover a sampling of one approach for each of 17 signalized intersections. These calculations of simple delay are based on the following relationship :

$$\text{AVERAGE PEDESTRIAN DELAY} = \frac{(\text{Cycle Length} - \text{WALK Time})^2}{2 * \text{Cycle Length}}$$

TABLE 4-11 OF DRAFT EIR, 2018 Existing Scenario – Ped LOS – a.m. Peak, Signalized Intersections

S. Kaiser February 24, 2019

			DATA FROM DEIR, TABLE 4-11					ALTERNATE CALCULATION,	
Intersection Number	*INTERSECTION*	Crossing Lanes	Crossing Volume	CYCLE LENGTH	WALK TIME	Pedestrian DELAY	Ped Level of Service	Pedestrian DELAY	Ped Level of Service
7A	Bow Street & Warren Avenue	1	458	60	22	1.85	A	12.0	B
7B	Somerville & Warren Avenues	2	804	60	22	2.06	B	12.0	B
8	Washington, Somerville & Webster Avenues	3	612	120	8	2.23	B	52	F
12	Somerville Avenue & Linden Street	2	532	60	5	1.96	A	25	E
13	Somerville Avenue, Washington & Prospect Streets	4	1138	120	4	2.55	B	56	F
17	Prospect Street, Webster & Concord Avenues	1	91	120	4	1.55	A	56	F
20A	McGrath Highway & Washington Street	2	927	117	7	2.58	B	52	F
20B	McGrath Highway & Washington Street	2	950	117	7	2.19	B	52	F
20C	McGrath Highway & Washington Street	2	147	117	7	1.91	A	52	F
20D	McGrath Highway & Washington Street	2	503	117	7	1.98	A	52	F
21	Somerville Avenue & Medford Street	3	440	102.5	7	2.27	B	44	F
23	Somerville Avenue & School Street	2	651	60	19	2.00	A	14	C
33	Prospect Street & Cambridge Street	2	705	120	5	2.21	B	55	F
34	Webster Avenue, Columbia & Cambridge Streets	2	551	120	5	2.22	B	55	F
35A	Cambridge,Hampshire, Beacon,Springfield Streets	2	776	180	5	2.14	B	85	F
35B	Cambridge, Beacon & Antrim Streets	2	129	180	5	1.81	A	85	F
37	Beacon Street & Washington Street	2	724	120	5	2.20	B	55	F

My calculations of delays were significantly higher than those shown in Table 4-11, between a factor of six and forty times higher. This is no small difference. The DEIR included no description of the formulas used to estimate delay and how the number of lanes and the crossing volumes enter into the delay estimate. The DEIR improbably shows delays in the range of 1.5 to 2.5 seconds, with typical levels of service of A or B. The Final EIR should include explanation and recalculation of delay estimates. Also please indicate whether the crosswalk is "exclusive WALK" or "concurrent WALK," the latter reflecting more friction with traffic. Countdown signals can also be a significant improvement.

In summary, traffic signal operations are shown with unusually low WALK times in most cases, and unusually low delay times. Levels of Service for pedestrians appear unduly high. Tables 4-11 through 4-17 show WALK times as short as 3.5 seconds, 4 seconds and 5 seconds. All WALK times in Table 4-11 through 4-17 that are less than seven seconds are below the minimum times set by the *Manual for Uniform Traffic Control Devices*, a Federal document fully accepted and applicable to Massachusetts.

The delay estimates for unsignalized intersections shown in Table 4-12 appear more reasonable and show greater variation in pedestrian LOS. The relationship between LOS and delay for pedestrian crossings also seems reasonable, and is a significant improvement in methods described in various editions of the *Highway Capacity Manual* (Transportation Research Board). An explanation of the unsignalized delay methodology would be useful.

By my own calculations of pedestrian delay at signalized intersections, and by the DEIR calculations of delay at unsignalized intersections, there are numerous examples of Levels-of-Service *F* at and around Union Square. Such undesirable performance does not meet the planning goal of the Union Square Neighborhood Plan as *"advancing a pedestrian-first modal hierarchy"* that *"will favor pedestrians first,"* and then other modes (page 4-1). The goal to comply with these plan objectives should be to lengthen WALK times and reduce pedestrian delays. Anything else perpetuates the prevailing auto-centric nature of Union Square and fails to create a quality pedestrian environment.

Positive change that could be made in addition to increasing WALK times is to reduce the cycle lengths at signalized intersections. Also note that signalized intersections have a tendency to reduce efficiency when green times exceed 30 seconds. Loss of capacity due to short lanes is greater for longer cycle lengths. The DEIR seemingly was headed in the right direction, and then suddenly things went wrong. However, by implementing signal timing changes to reduce pedestrian delays, the Union Square plan can be made consistent with its honorable objectives. SK.7

TRAFFIC ANALYSIS

Scoped for 37 intersections (pp. 10-11 of the August 31, 2018 scope), about thirty of the locations are not near capacity and did not appear to create safety or capacity problems. No further traffic analysis effort should be expended on those thirty locations.

There are too many intersections that do not qualify as potential problems because they have LOS A or B traffic levels of service. We do not need to study them any more in the FEIR. Identify the key half dozen or so intersections that are of concern, and assemble a full Synchro printout showing signal phasing, pedestrian crossing times, ands short lanes – learning from the recent experience of a 15% capacity loss at the Boston University bridge .

For many years, the complexity of studies of traffic flow has grown and produced hundreds of pages of computer calculations. The DEIR includes about 500 of its 2500 pages in Synchro printouts. Not only is the traffic vs transit assessment out of balance, but almost all traffic studies cover a dense local network of intersections. For any one EIR there may be only a handful of intersections that qualify as "bottleneck" locations worthy of special study.

MEPA must provide guidance when the computer models fail under LOS F conditions and cannot calculate an accurate queue length. Usually Synchro only calculates four minutes of queuing and then the program stops, declaring that the queue length is "theoretically infinite." In the DEIR, estimates of intersection delay and queue lengths are shown only in the Appendix Synchro calculations between pages 1612 and 2117. The information is there, but it requires a "deep dive' for the reader to find it. I recommend that the new text to include a special summary table for all bottleneck locations ; showing LOS, V/C, delay and queue length, including those location with queue lengths that are "theoretically infinite." SK.8

In general, MEPA practice has been to define a study area, with all locations within the area being treated equally for attention. It is too late to redefine a study area for Union square, but the lesson the future is that the ENF review could be used to identify significant intersections, and MEPA should scope out non-problem locations with LOS A or B, to indicate their relative in significance. The scoping process should sort out important intersections from unimportant ones. A number of bottleneck locations at some distance from the intersection could be studied. In the DEIR Inman Square was both somewhat distant and located in an adjacent city, Cambridge, but is congested location. In the other direction, key congested bottlenecks are Gilmore bridge and O'Brien Highway, and Leverett Circle, but were not included in the DDEIR for analysis. Even further afield, the BU Bridge is not a suitable route for more traffic to and from Union Square. A few distant bottlenecks are of more value as measures of impact than several dozen nearby non-bottleneck locations.

PARKING ISSUES

Parking deserves special attention as new ideas such as shared parking and shared vehicles can be used the reduce the number of built parking spaces. Parking garages have cost, aesthetic and social limitations which generally fail to contribute to the "vibrancy" or general activity of any neighborhood. Therefore a full calculation of parking needs with shared spaces and shared vehicles should be made. With the variety of transit services, a high rate of shared vehicle uses should be considered, with 50% or more of housing units participating. Locating parking garages on the first floor near sidewalks and pedestrian areas should be discouraged. SK.9

STORMWATER AND CSO PROBLEMS IN THE PAST

Chapter 9 discusses stormwater issues, with attention to the interaction between Somerville combined sewer systems and the MBTA drainage system between Washington street and North Point/Millers river (pages 9-1 and 9-2). More information is needed on the history of flooding in the area and CSO events occurring as a result, with special focus on the North Point area and the Millers River culvert.

I cannot remember the exact dates of the storms, but between 2000 and 2015 there were several occurrences of heavy rains producing CSO flooding at Union Square. This resulted in flooding of basements on businesses at Union Square, as well as CSO problems at the Washington Street underpass of the Lowell Line of the MBTA. The apparent cause of these incidents was a clogged four-foot diameter pipe installed in the early 1960s when the Boston and Maine did its last legal filling of the Millers river Basin. State waterways officials allowed the filling, provided that the railroad build underground pipes to handle the drainage functions previously served by the millers river.

In addition, as a condition for its waterways filling license, the railroad agreed to maintain the pipe in perpetuity, to assure proper drainage flow. This waterways license was issued December 13, 1962 as permit # 4632 and is still in effect. The license required that the drains "*shall be maintained in good condition by the licensee, its successors or assigns, at all times.*"

In 1977 when the MBTA purchased North Point land from the railroad, it absorbed responsibility for maintaining those sections of the four-foot pipe that now were on MBTA property. However, the culvert became clogged in the 1990s with very little flow. The result was that in heavy rains, trapped flows in the culvert flowed over into other areas of Somerville's sewer system, causing combined sewer overflows at Union Square.

I do not know the pipe connection pattern between Somerville and what the DEIR calls the "MBTA system." (9-1) This system should properly be identified as the Licensed Railroad system, now shared by the railroad and the MBTA. The FEIR should include a map indicating the culvert location and the limits of jurisdiction of ownership/license responsibilities. SK.10

Around 10-15 years ago, the EPA with support from DEP, sought to enforce the maintenance requirement on the railroad, with no positive response from the railroad – which refused to take action. EPA finally convinced MBTA to clean out the entire pipe, including the sections on railroad land. MBTA's initiative has resulted in no CSO problems at Union square in the years since, to the best of my knowledge.

Clearly it is in the interests of the developer, his tenants, the local businessmen and residents at Union square to avoid any clogged pipe re-occurrences now and in the future. Therefore, state action should be imposed to enforce the 1962 License and its conditions requiring maintenance. If conditions of the license are violated, the state should suspend the Chapter 91 license of the railroad, and also suspend the right of users of the railroad land from continued use of the filled land until necessary maintenance has been completed. The obligation shall include a requirement to coordinate with the MBTA for the mutual responsibilities to keep the pipe clear, with alternating responsibilities between parties. About ten years ago, the MBTA cleaned out the entire pipe. A need for maintenance shall be defined by a drop of 25% in pipe capacity due to clogging. The next major maintenance cleaning shall be the responsibility of the railroad to clean out the entire pipe.

The arrangements between the railroad, MBTA, EPA, DEP, MWRA, EEA and the city of Somerville should be included in the Section 61 finding for the Union Square project. *"Once all three components are complete, the connection will divert stormwater from approximately 200 acres from the City's combined sewer system to the MBTA's stormwater* SK.11

system, which discharges to the Millers River and then to the Charles River, thereby conditionally removing significant stormwater volumes that currently drain to the Deer Island Treatment Plant." (pp. 569-570) If the culvert becomes clogged, its primary function to remove stormwater flows from CSO flows now directed to Deer island will be prevented. The ability of the Somerville sewer system improvements to successfully separate combined sewage will be inhibited.

FORMAT FOR PUBLIC COMMENTS

The DEIR includes a separation of comments into categories of supportive and in opposition. The arrangement is not consistent with MEPA principles of not supporting or opposing individual projects and against proponents seeking out "supporters' to write letters of general agreement that say nothing about MEPA compliance.

In the next EIR, there should be only two categories of comments received, those from federal, state and city agencies, and those from citizens, including groups. No special organizing of comments should occur and they should be printed in order of receipt by the MEPA office. Responses to comments should direct the reader to FEIR page numbers and not chapter numbers. SK.12

CONCLUSIONS : PROPER TRANSIT PLANNING AND MITIGATION

In order to create dense urban development without severe traffic congestion, the developer should have laid out a much more detailed program for transit ridership enhancement. The original ENF plan for Suffolk Downs was for three transit trips for every two vehicle trips. The result for Union square is a very disappointing 1.1 transit trips for every two vehicle trips. Why should Union square be only 1/3 of the transit trip rate for Suffolk Downs ENF ? More creative thinking on transit is needed at Union Square.

In fairness to this developer, the DEIR may have uncovered inherent defects in Green Line service that limit the use of the spur tracks to Union Square. The MBTA has ordered added cars for the GL Extension, but with the added track lengths the number of trains per hour remains the same as today. New rider loads from GLX are being added onto the existing downtown Boston station bottlenecks, such as Park and Boylston Streets.

Furthermore, service on the Huntington Avenue E-line is notably slower than on the B, C and D lines. The Huntington Avenue service will continued into Union square on six to seven minute headways. If the Green Line in overloaded today, the situation is likely to be worse upon completion of GLX and the current design for Union Square. .

Such a result was not contemplated by either the MBTA or Somerville during the advocacy a decade ago for a Union Square branch. Now the time has come to release newly generated trips to the road and transit system, and the consequences must be faced. The developer is the one generating the trips and the MBTA has the transit system that needs more practical capacity.

It is the role of Alternatives to bring about consideration of different ways of building, operating and mitigating things. The final EIR should consider new modal splits associated with Union Square development, and then outline the necessary changes in Green Line operations to match the need for more transit capacity. SK.13

As noted earlier in these comments, a transit mitigation strategy becomes "doable" if the Green Line changes can be identified as primarily operational in nature, and thus affordable for the MBTA. The developer should not need to invent a new system of transit operations. The solution comes from simple consideration of historical achievement in Boston transit. The increased capacity was already achieved decades ago during the early streetcar decades. The 1911 schedule for trains at Park Street show 316 streetcars coming from Boylston Street and hour passing through Park Street station. The average headway is eleven seconds. By today's schedules, service into Park Street occurs with 90 second headways. Admittedly, today's trains are longer and more cumbersome than vintage trolley cars, but they are not ten times longer.

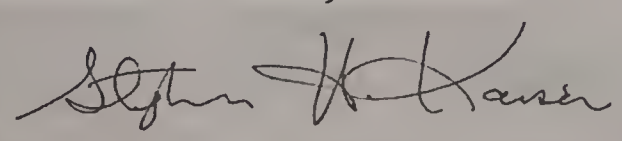
Today's Green Line trains average 9 mph, about half the average speeds on the Red Line (18 mph). If Green Line trains could be speeded up by 50% to 13.5 mph, the capacity of the Green Line would increase by 50% with the same number of trains and operators. Trip times would be reduced by about a third. Green Line capacity would be increased sufficiently to handle new trip growth from Union Square. With more Green Line capacity, more potential riders now driving on local streets could ride the Green Line and stop driving their cars.

If the number of cars generally at Union Square goes down, vehicle trip generation from new development could be more easily handled on local streets. A logic becomes available for avoiding the problems of over-development at Alewife in Cambridge, where new trips are added, but no comparable transit capacity improvements are made. The result at Alewife is a collection of the worst congested arterials in the Boston area.

Therefore, with a formula for improved service on the Green Line, Union Square development can now be considered with 40% and 60% transit ridership. Memories of a 22% transit model share in this DEIR can become relegated to near-forgotten historical archives. A new and detailed model split analysis with a step-by-step sequence of demonstrated calculation should be used to reconsider all mode shares. New vehicle trip generation should be down to 20-30% or less. Bicycles may be 15% in Cambridge, which is largely flat, but Somerville is the City of Ten Hills and bicycles are more difficult to operate with steep hills. My bicycle shop estimates that wintertime customer loads are down by 75%, reflecting the difficulties of riding bikes in winter. The pedestrian figure of 23% seems high and should be recalculated and justified. Pedestrian activity is also affected by bad weather.

Note that the improved capacity on the Green Line would benefit all riders, even if they do not go to Union Square. The investment benefits in GLX operational improvements would appear more obvious and legitimate. Further transit analysis and imagination could help guide transit service planning in the future, as well as properly conceived Transit Oriented Development. .

Sincerely,



Stephen H. Kaiser, PhD
Citizen Engineer and
Historian

cc. Bill Cavellini
Anson Stewart

SK.1 **Current trips to Union Square have an auto mode share of 38.8%.**

The DEIR included an error that mistakenly identified the auto mode share as 38.8%; the journey to work data for the area around Union Square referenced in the DEIR shows that the non-auto mode share is 38.8% and the auto mode share is 62.2%.

SK.2 **Something clearly has gone wrong in the DEIR if transit ridership, both rail and bus, is only 22%. A proper consideration of transit alternatives would allow for a total project that would generate more transit trips, fewer auto trips, and have an improved pedestrian environment.**

The DEIR included an error that mistakenly identified the auto mode share as 38.8%; the current journey to work data for the area around Union Square shows that the non-auto mode share is 38.8% and the auto mode share is 62.2%.

US2 agrees that transit mode share is an important factor in minimizing vehicle use. However, the share of pedestrian and bicycle trips is also an important factor, as not every individual is travelling longer distances that are best done by transit. It is anticipated that pedestrian and bicycle trips will continue to be an important mode of travel in, through and out of Union Square by future residents and workers, and encouraging these modes of travel is important for balancing the impacts on transportation infrastructure.

In addition, the mode share percentages were determined through coordination with the City. The focus of these mode share percentages was to reduce vehicle trips and encourage other modes of travel, whether they be transit, walking or bicycling. The goal of the Project's required monitoring programs that will be implemented for each Lot will be to continue to evaluate these mode share percentages, with the goal of reducing vehicle trips, and appropriately identify potential mitigation and programs that may be needed to further reduce vehicle trips. The City and US2 are anticipated to continue to work with the MBTA as the GLX operations mature to identify any improvements to Green Line service and/or bus service to ensure that transit service appropriately meets demand.

Although alternative analyses with different mode shares would change the transportation analysis, US2 believes that the results of such an analysis would not provide information that can inform future conditions and potential mitigation, as the analysis would not be consistent with agreed upon goals outlined with the City or currently anticipated transportation habits.

SK.3 **Parking garages could be much smaller in scale, with an emphasis on shared vehicle use.**

The Project garages have been planned and designed with an emphasis on shared vehicle use that has resulted in smaller scale garages and fewer parking spaces than other nearby developments. Section 4.5.6 of the DEIR provided a description of the shared parking analysis completed for the Project. The basis of the parking demand model used by US2 to evaluate the shared parking strategy described in the DEIR is the City's parking demand estimator which was used to estimate potential parking demand for the Project based on the proposed program of office/lab, retail, hotel, and residential uses. Section 2.3 of this FEIR provides additional detail on the shared parking analysis methodology. Appendix D3 includes the results of the Shared Parking Model for the Project, which includes parking spaces by use.

SK.4 **The Final EIR for Union Square should initiate the process of looking into the capabilities of bus lanes around Union Square, and assessing their capabilities.**

The City and the MBTA have developed a pilot bus lane on Prospect Avenue northbound between Webster Avenue and Somerville Avenue to speed service and increase the reliability of buses in the area. The bus lane is under evaluation with the intent of making it permanent (by the City) as part of ongoing area improvements. As part of on-going coordination with the City and the MBTA, US2 will participate in considerations of transit system improvements in the Union Square area, including potential bus lanes.

Section 4.5.3 of the DEIR included an innovative evaluation of bus capacity and anticipated Project-generated impacts relative to the rider Comfort Metric as defined through the MBTA's Service Delivery Policy. Completed at the request of and in cooperation with the MBTA/MassDOT, this new analysis is meant to identify specific issues and challenges which can be addressed through ongoing processes. The Project has been, and will continue to work with the City, the MBTA and others to support bus service improvements. These include engagement in the Better Bus project, implementation of the bus lane on Prospect Street, overall roadway and traffic signal modifications and bus stop improvements.

The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts. The City has both the ability and the willingness to attempt additional interventions to benefit transit. The City may use the overall transportation mitigation and investment dollars provided per US2's development agreement to implement roadway changes. In addition, through the individual plans for each Lot, US2 will work with the City on potential transit improvements proximate to each Lot. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger operations within Union Square and will be used to help determine future improvements or the success of ones previously implemented.

Section 2.5 of the FEIR provides specific transportation metrics that would suggest when modifications to the transportation system could be implemented to improve the MBTA's bus network, and what those modifications could be. To fund these potential improvements, the Project will allocate a portion of committed offsite infrastructure and future phase contributions to rapid-response, short-term mobility and safety retrofits in the Project area.

SK.5 **The developer should review Chicago's experience with identifying bunching incidents and seeking to respond.**

US2 understands the concerns raised about bus bunching and wait times. Although US2 does not have the ability to control bus operations, US2 will raise these concerns with the City for their use in continued coordination with the MBTA regarding local bus operations. The MBTA is currently undergoing evaluations of bus services throughout its system to identify areas in need of improvement. The bus evaluation in the DEIR provided information to the MBTA regarding bus service through and adjacent to Union Square, and it is anticipated that this information will help inform the MBTA regarding issues of concern in the area, and areas where additional operational efficiencies may be required.

As described in Section 2.5.3, subsection MBTA Bus Service Mitigation, at the request of MassDOT and MBTA, US2 completed a focused analysis on MBTA bus service using a new methodology developed by the joint MassDOT/MBTA OPMI. The emphasis of this analysis was to review the overall impacts of Project-generated trips, through the course of a day, relative to the Comfort Metric established through the MBTA's Service Delivery Policy.

Section 2.5.3, subsection MBTA Bus Service Mitigation, provides a description of potential interventions to improve MBTA bus service in the Study Area. The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts. The City has both the ability and the willingness to attempt additional interventions to benefit transit. The City may use the overall transportation mitigation and investment dollars provided per US2's development agreement to implement roadway changes. In addition, through the individual plans for each Lot, US2 will work with the City on potential transit improvements proximate to each Lot. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger operations within Union Square and will be used to help determine future improvements or the success of ones previously implemented.

Further, as a condition of its master plan approval, US2 committed to improving the accessibility and comfort of existing bus stops that are located on Project Lot frontages (i.e., six existing bus stops located on Lots D1.2, D3.1, D3.1, D4.3, D6.2 and D7.2).

As plans are submitted for each Lot, US2 will work with the City and the MBTA on the location, potential improvement and design of bus stops per the then current MBTA plans and City and MBTA design guidelines. This process is underway for the bus stop on Prospect Street proximate to Lots D2.1, D2.2, and adjacent to the future Union Square Station.

SK.6 **WHY are WALK times now and in the future set below the minimum allowed in MUTCD, if the prevailing policy is "pedestrians first"? While the format for pedestrian delay contained in Tables 4-11 to 4-17 is excellent, all calculations of delay lack credibility. On the right-hand side of the calculation sheet below, I have included my calculations for simple delay using data from Table 4-11 (Existing AM Peak), to cover a sampling of one approach for each of 17 signalized intersections. My calculations of delays were significantly higher than those shown in Table 4-11, between a factor of six and forty times higher. This is no small difference. The DEIR included no description of the formulas used to estimate delay and how the number of lanes and the crossing volumes enter into the delay estimate. The DEIR improbably shows delays in the range of 1.5 to 2.5 seconds, with typical levels of service of A or B. The Final EIR should include explanation and recalculation of delay estimates. Also please indicate whether the crosswalk is "exclusive WALK" or "concurrent WALK," the latter reflecting more friction with traffic. Countdown signals can also be a significant improvement. The delay estimates for unsignalized intersections shown in Table 4-12 appear more reasonable and show greater variation in pedestrian LOS. The relationship between LOS and delay for pedestrian crossings also seems reasonable, and is a significant improvement in methods described in various editions of the Highway Capacity Manual (Transportation Research Board). An explanation of the unsignalized delay methodology would be useful. By my own calculations of pedestrian delay at signalized intersections, and by the DEIR calculations of delay at unsignalized intersections, there are numerous examples of Levels-of-Service F at and around Union Square. Such undesirable performance does not meet the planning goal of the Union Square Neighborhood Plan as "advancing a pedestrian first modal hierarchy" that "will favor pedestrians first," and then other modes (page 4-1). The goal to comply with these plan objectives should be to lengthen WALK times and reduce pedestrian delays.**

The Project is consistent with and derived from Somerville's recently completed Union Square Neighborhood Plan. The Neighborhood Plan sets a vision for Union Square and the Project based on community-based values. This includes a very intentional approach to mobility and transportation management that privileges pedestrians, transit riders, and cyclists over vehicles to create a walkable, vital employment center. Increasing mode-share and "throughput" for non-auto modes over auto modes is central to this goal.

Section 2.1 describes the methodology used to determine the PLOS analysis included in the DEIR. The methodology comes directly from the HCM published by the TRB. The PLOS for signalized intersections follows the methodology detailed in Chapter 18 of the HCM,

and the unsignalized intersections follow the methodology detailed in Chapter 19 of the HCM. These methodologies are industry standards backed up by years of research by TRB. It should be noted that adjusting the walk times to the maximum pedestrian interval length at each intersection provided no significant changes in the overall PLOS score and did not affect the PLOS of the intersections.

The changes in the PLOS between the No-Build and Build Condition at the signalized intersections are due to the increase in traffic volumes within the study area and are not significant increases. The unsignalized intersections that are affected in the Build Condition will likely not be as adversely impacted as shown given the generous yielding to pedestrians exhibited by most drivers in the Union Square community. This PLOS analysis likely overestimates expected delay.

The DEIR, Section 4.5.2 pages 4-94 – 4-95, provides potential intersection modification elements to improve pedestrian delay and safety as pedestrian volumes grow. These individual intersection improvements will be completed on an ongoing basis at appropriate times by the City, with support of US2.

SK.7 **Positive change that could be made in addition to increasing WALK times is to reduce the cycle lengths at signalized intersections. Also note that signalized intersections have a tendency to reduce efficiency when green times exceed 30 seconds. Loss of capacity due to short lanes is greater for longer cycle lengths.**

Changes to the overall cycle lengths may be considered by the City to improve safety and operations for all users as part of ongoing evaluation which will be informed by US2's monitoring plan.

US2 and the City understand that additional transportation-related modifications may be necessary. Transportation improvements such as right-of-way allocation, traffic signal timing or phasing, and others will continually involve balancing tradeoffs between modes. For example, adding a protected bicycle lane may worsen traffic congestion due to elimination of a travel lane, and adding pedestrian time to a traffic signal may slow buses, as signal timing is altered. The City has taken direct responsibility for completing transportation infrastructure changes, including making necessary determinations by mode, following the then current neighborhood, City and MassDOT planning and design guidelines.

SK.8 **I recommend that the new text to include a special summary table for all bottleneck locations; showing LOS, V/C, delay and queue length, including those location with queue lengths that are "theoretically infinite."**

The DEIR (Section 4.5.5.5 and Appendix B) provided intersection capacity results for all study area intersections for the 2025 Build Condition for the a.m., p.m., and Saturday peak periods and is consistent with standard TIA guidelines. As indicated on Table 4-60

(page 4-201) in the DEIR, at one location, the unsignalized intersection of Washington Street / Columbus Avenue / D1 North Driveway, the result for delay and queue length during the p.m. peak hour exceed the parameters established for the traffic model. Note that 'N/A' was used numerous times in Table 4-64 to indicate a turning movement that did not exist in either the existing or future build condition. As discussed in the DEIR, several intersections are slated for design or upgrade by the City as part of the continued implementation of the Neighborhood Plan and other ongoing initiatives. The City will complete robust design processes for each, including reviews of alternative signal phasing and geometric phasing per the then current guidelines and transportation information.

SK.9 **Parking deserves special attention as new ideas such as shared parking and shared vehicles can be used the reduce the number of built parking spaces. Parking garages have cost, aesthetic and social limitations which generally fail to contribute to the "vibrancy" or general activity of any neighborhood. Therefore a full calculation of parking needs with shared spaces and shared vehicles should be made. With the variety of transit services, a high rate of shared vehicle uses should be considered, with 50% or more of housing units participating. Locating parking garages on the first floor near sidewalks and pedestrian areas should be discouraged.**

As described in Section 2.3, the basis of the parking demand model used by US2 to evaluate the shared parking strategy described in the DEIR has been under development with, by, and for the City through multiple processes governing Union Square and beyond, including the Neighborhood Plan, the CDSP, Union Square Zoning, and the City's Parking Demand Model.

The original analysis and concept for the Shared Parking Model was developed through the Neighborhood Plan. The Shared Parking Model included a review of potential land use for the entire Neighborhood Plan area, which extended well beyond the D Blocks included in the Project. It further explored factors to be applied that would reduce overall parking demand and placed them within a Union Square context. Appendix D3 includes the results of the Shared Parking Model for the Project.

Although the Project is currently anticipated to be developed as phases as described in Section 1.2.3.1, parking associated with individual Lots will be realized as conditions, needs and opportunities dictate. Parking will be an ongoing consideration, but supply will be provided by Lot as described in Section 1.2.3.1. As required by Union Square Zoning and codified in the CDSP, all commercial parking will be shared between Project uses and available to the public as determined. All commercial parking, as it is built out, will be gate controlled, with parkers having access through a ticketing or reader card system. See Section 2.3.2 for additional details regarding the management of parking.

The proposed commercial parking garage locations were selected as part of the master planning process to maximize the opportunity for shared parking. The largest parking facilities were located on the largest Blocks (D1, D2 and D3) and at the edge of the

neighborhood in order to 'intercept' cars and reduce vehicle trips through the heart of the neighborhood. Each of the parking structures that are located on designated pedestrian streets (i.e., Washington Street, Somerville Avenue, Prospect Street, Bow Street and Webster Street) will be lined with non-parking uses to ensure a vibrant and pedestrian friendly streetscape. Vehicular entrances to each of the parking structures will be located off of the pedestrian streets to minimize the number of points of pedestrian and car intersection. The Project master plan includes the provision of underground parking on portions of D1, D3 and D6 where below-grade parking appears feasible. Soil contamination, water table location and soil conditions all influence the feasibility of underground parking.

SK.10 **The FEIR should include a map indicating the culvert location and the limits of jurisdiction of ownership/license responsibilities.**

Figures 9-1 and 9-2 entitled "Overall Drainage Plan," provided as part of the DEIR and included in Appendix A1 of the FEIR demonstrate the limits of the proposed culvert within Somerville Avenue as requested.

The culvert and all associated infrastructure will be owned and maintained by the City. There will be no licensing agreements established.

SK.11 **The arrangements between the railroad, MBTA, EPA, DEP, MWRA, EEA and the city of Somerville should be included in the Section 61 finding for the Union Square project. "Once all three components are complete, the connection will divert stormwater from approximately 200 acres from the City's combined sewer system to the MBTA's stormwater system, which discharges to the Millers River and then to the Charles River, thereby conditionally removing significant stormwater volumes that currently drain to the Deer Island Treatment Plant."**

The proposed Section 61 finding includes US2's proposed mitigation measures, including measures to reduce stormwater runoff from the Project site. US2 is not a party to specific agreements between other third parties connected to stormwater management for the Union Square neighborhood and therefore, those agreements have not been included herein. US2 will pass along the commenters suggestions to the City and will continue to coordinate as appropriate with the City and other third parties to ensure that the Project and the infrastructure improvements that it funds have a positive impact in reducing the stormwater volumes that drain to the Deer Island Wastewater Treatment Plant.

SK.12 **In the next EIR, there should be only two categories of comments received, those from federal, state and city agencies, and those from citizens, including groups. No special organizing of comments should occur and they should be printed in order of receipt by the MEPA office. Responses to comments should direct the reader to FEIR page numbers and not chapter numbers.**

The comment letters have been organized by State Agency, Regional Agency, Local Government, Local Community Groups, and General Public. This organization is done to help each interested party find their respective comment letter and responses.

To ensure accuracy of references in the FEIR responses to comments, section numbers are used instead of page numbers since most responses refer to text that is covered on multiple pages. In addition, most individuals receive a searchable digital version of the document, which typically has a different page number system than what is shown on the page, and also includes bookmarks for each section, allowing for quick and easy access between sections. To minimize the need to read every section referenced in a response, the Project team has provided summarizes of longer sections in the response, and responded as directly as feasible to each comment.

SK.13 **The final EIR should consider new modal splits associated with Union Square development, and then outline the necessary changes in Green Line operations to match the need for more transit capacity. A new and detailed model split analysis with a step-by-step sequence of demonstrated calculation should be used to reconsider all mode shares. New vehicle trip generation should be down to 20-30% or less. Bicycles may be 15% in Cambridge, which is largely flat, but Somerville is the City of Ten Hills and bicycles are more difficult to operate with steep hills. My bicycle shop estimates that wintertime customer loads are down by 75%, reflecting the difficulties of riding bikes in winter. The pedestrian figure of 23% seems high and should be recalculated and justified. Pedestrian activity is also affected by bad weather.**

The mode splits for Project-site generated person trips were determined through coordination with City staff and confirmed with MassDOT. Overall, the vehicle-non-vehicle mode share split is 40%-60%, consistent with permitting agreements and larger neighborhood and City goals. US2, together with the City, will implement a variety of methods to de-incentivize vehicle use and encourage and increase the non-vehicle mode share.

Mode shares used for Project trips assume the existence of the Green Line and the opening of Union Square Station and the continued evolution of Union Square in accordance with the Neighborhood Plan. The implementation of planned bicycle and pedestrian improvements will promote and encourage increased use of these non-motorized transportation modes.

The Project's monitoring and annual reporting plan and the MBTA's data collection efforts will provide the necessary data for on-going analysis of transportation conditions related to modal splits, informing decisions regarding the need for additional mitigation measures to encourage non-vehicular transportation.

February 25, 2019

Secretary Matthew Beaton

Executive Office of Energy and Environmental Affairs

Attn: Alex Strysky

100 Cambridge Street, Suite 900

Boston, MA 02114

Dear Secretary Beaton,

Thank you for the opportunity to provide comments on the Draft Environmental Impact Report (DEIR) of the Union Square Redevelopment Project (EEA# 15889), as submitted by Union Square RELP Master Developer LLC (US2) and Somerville Redevelopment Authority (together, the Proponent).

My name is Paola Massoli, and I have been a Somerville resident since 2010. I live in East Somerville, half mile from Union Square, and I currently work for a clean-tech startup at Greentown Labs. I have a background in atmospheric sciences, and the environment is at the front and center of my professional and personal life. I currently serve on the board of the Union Square Neighborhood Council, which has been deeply involved in the Union Square Redevelopment project. As council member, I pledged to work hard to make Union Square a model for modern and sustainable development. As many other residents living and working in Union Square, I do not want this redevelopment to be an environmental and social burden to us and to the city. I trust you to fully understand the scale and magnitude of this decades-long project, as your office denied the MEPA waiver last year, and requested a full DEIR from the developer.

Below are my comments to the responses provided by US2 to your office, and to the other state agencies, advocacy groups and private citizens listed in Table 14-1. It is not my job to decide if such responses are satisfactory to you, qualitatively and quantitatively, and compliant with the MEPA process. However, it appears to me that the developer disregarded many of the excellent suggestions on how to significantly

reduce the largest environmental impacts arising from such project. Many responses are vague; for instance, to this date there is no sign that the developer has accommodated key concerns raised by the public around location of parking garages and green space. Furthermore, accessibility to the Union Square Green Line station remains a concern. This is highly troubling and inconsistent with the promises made by the Proponent (US2 *and* the City) to follow Smart Growth and sustainable development principles.
This project will have great effects not only for Somerville, but for the entire Boston area. You have the authority and capability to help the city of Somerville and US2 to do the right thing, and I thank you in advance for that.

I hope my comments clearly highlight what I believe are the remaining outstanding issues that need to be resolved. These comments reflect my opinion, and not of the Union Square Neighborhood Council.

Best regards,

Paola Massoli, member
Union Square Neighborhood Council
47 Pearl Street, apt. 3
Somerville, MA 02145
(720)-206-9982
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1) **Process and Accountability**

Through Chapter 1 of this DEIR, US2 did provide a list of federal, state and local regulatory standards and requirements to be followed during the construction of the project in response to the MEPA.8 and 9 comments, stating that the project will comply with such requirements. However, on 1.3.3.5 (Somerville Redevelopment Authority – Land Acquisition), US2 claims to 'use good faith diligent efforts' to acquire land; that is a rather vague statement. Similarly, on 1.3.3.6 (Somerville Director of Transportation and Infrastructure – Mobility Management Plan), the statements around mobility are vague. On hazardous waste and contamination during construction, the developer has produced mesoscale air quality analysis and provided a long list of historical data of known contaminants measured in each of the parcels, with details about the regulatory status of each area. According to the developer's own assessment, many areas cannot be further tested due to property ownership reasons. This results in a large uncertainty on the magnitude of the contaminants that will be released in the air and in the soil once development starts. Consequently, our health rests in the good faith of the developer to follow due process, and in the MassDEP capability to oversee and supervise the execution of the plan that the developer proposes to follow in the decades to come. Personally, some of the worries expressed by the Union Square Neighborhood Council (USNC), the Somerville Catholic Collaborative (SCC), and private citizens through letters sent in August 2018 around contamination and pollution during construction remain unchanged, mostly because decisions made now will impact the next two decades, without no or little possibility change plans, if needed in the future.

<u>The final version of this EIR should establish a clear process and accountability measures for how the Proponent will comply with existing and future requirements to protect the health of the Union Square residents and workers.</u> There must be a clearly stated commitment by the developer to be willing to rescale and repivot current plans based on future circumstances, e.g., unknown sources of contaminants in soil or similar issues. PM.1

Continuing the theme of process and accountability, some of the responses provided to the MEPA comments are disappointing. For example, the Secretary encouraged 'the Proponent to review the design refinements by the USNC and incorporate any feasible

elements that minimize impacts (MEPA.10 comment). In particular, the Council asked the Proponent to consider a development plan that is 20-30% less dense. In the 'Reduced Build' alternative, US2 chose to maintain the same size hotel and to almost double laboratory space at the expense of housing, which became the determining factor to reject that 'Reduced Build' alternative. However, the developer failed to explore other ways of reducing density that would sacrifice neither housing or laboratory space, for example, by choosing to locate some of the parking garages PM.2
underground. This choice would free up precious land that could be dedicated to open space, as demanded by the Council and by other citizens, and, would reduce density without sacrificing housing or other commercial developments. The long-term social and environmental benefits of such choices would greatly outweigh the upfront costs.
Similarly, the developer did not respond to the specific encouragement to design open PM.3
space in a way that minimizes exposure to air pollution, a problem that directly applies to the D2 layout. Design alternatives for the D2 parcel have been in discussion for several months now, and to date, we still do not have an answer on the community request for redesigning the green space in the D2 parcel to minimize the exposure of the public to traffic emissions. I simply find it troubling, and symptomatic of a larger problem with proper process.
<u>I expect an answer from the EEA office to these systemic issues.</u>

2) Environmental Impacts from Traffic, and Smart Transit Options

The impacts from the increased traffic to and through this area will be significant, as recognized by the Proponent and pointed out by the comments that were submitted to the EEA office. Several MEPA comments (MEPA 1. through MEPA.5, MEPA.15, MEPA.18, MEPA.19 and MEPA.22) address issues directly and indirectly associated with increased traffic in the area. According to the Proponent, the development is fully supposed to take advantage of the Green Line Extension. However, it appears that US2 is still planning to construct several parking garages for a total of ~1,495 off-street spaces (page 1-21 of the DEIR). This choice goes against the City own statements in Parking Maximum and Parking Management section of the letter sent on August 23, 2018 (see chapter 14, support letters) "to strictly limit construction of new parking". In fact,

according to a city sponsored study mentioned in that letter, the recommended 'parking ratio' is 0.47, corresponding to less than 1,200 new parking spaces added (note that 1200 parking spaces corresponds to a ratio of 0.48). The City should demand that US2 adheres to the original parking ratio value of 0.47, by reducing the amount of parking to disincentivize car usage and take full advantage of the Green Line Extension. By its own admission, the developer used peak parking demand to decide how much parking is needed, a choice that goes against the 'Smart Growth' principles of section 1.1 of the DEIR; in addition, the developer promised to favor pedestrians, bicycles and public transportation (page 4-1). If that is true, parking garages need to be scaled down. PM.4
Therefore, there is a disconnect between the US2 claim of 'reducing the demand for and the use of cars' with the proposal to build ~300 more parking spaces than what is recommended by the very Mobility Management Plan. Of course, the measures proposed in section 4.5.7 and 4.5.8 of the DEIR (such as providing MBTA transit passes to future workers) are excellent, but it is demonstrated that the best way to cut congestion and pollution is <u>to make driving unappealing</u>. Traffic pollution has been linked to acute and chronic diseases, increased mortality and even autism in children. <u>Union Square is already extremely congested as is and taking extra cars off the road by limiting parking space will increase the well-being and the safety of the residents.</u>

Locating parking garages underground and covering those surfaces with more green space would also increase the climate resilience of the area (discussed in chapter 6 of the DEIR). This is especially critical in D2 and D3, which are in low-lying and flood prone areas according to the city's own vulnerability assessment. Replacing the above ground parking planned for D2 with green space would also automatically provide an extra buffer for the T station located in D2. These above-ground parking garages are literally stealing land that could be dedicated to better uses that increase the resiliency of the area. Another developer in neighboring Boynton Yard - literally across the rail tracks – is planning for <u>underground garages</u>. Why not US2? PM.5

Continuing the topic of Smart Transit Options, the transit section of the same comment letter sent by the City in August of 2018 states that the Proponent is supposed to support the construction of "accessible pedestrian route from the station platform to

the corner of Prospect Street and Somerville Avenue". The access compliancy with the American with Disabilities Act (ADA) needs to be addressed as well, as also pointed out by MassDOT in its submitted memorandum. To the DOT.1, DOT.8 and MAPC.1 and CC.5 comments on access to the Green Line station, the Proponent responded that there have been meetings with MBTA, the GLX contractor and the City, but to date, there is no clear plan and this DEIR doesn't provide any meaningful additional information. The response in 4.5.3 to comments posed by MAPC is about bus routes and nothing is said on pedestrian access. There is not even mention to build an elevator from Prospect street, which might be necessary for severely disabled people. The current plan implies arduous paths for both ADA population and those who live on the Cambridge side. This is a grave omission with potential legal repercussions, and I really urge this office to convene the various agencies that are supposed to find a solution to this problem to ensure smart design of D2 and connectivity to the T in all directions of travel. PM.6

3) Climate Resiliency and Environmental Impacts from the Built Environment

US2 did not commit to much more than 'exploring viability' for many of the measures proposed by several agencies and summarized in the comments MEPA.21 to MEPA.25 to minimize energy use in the built environment. Also, the developer did not respond to the specific encouragement to install air filters in the HVAC systems in the buildings: the developer only mentions HVAC equipment installed during the construction phase. This is not acceptable for any of the buildings. ALL buildings should be built with the best available technology of the moment to mitigate indoor air pollution (LEEDv4 BD+C has a minimum indoor air quality performance requirement as pre-requisite; however, that doesn't include air filtration systems).

The developer seeks to certify 11 of the 17 buildings as LEED v4 BD+C Gold or Silver. In general, I have reservations about establishing building standards in advance, especially for constructions that are planned years from now. LEEDv4 will be most likely outdated in 5-6 years, and there are already better techniques that allow to achieve greater goals in terms of climate mitigation, adaptation and well-being of occupants.

To this regard, I appreciated the excellent comments provided by DOER regarding the Passivehouse (PH) design to significantly cut energy demand while improving affordability and climate resiliency, and I am disappointed at the developers' attitude towards these great suggestions. US2 rejected the feasibility of the PH design claiming high payback period (24 years); however, this payback period and the extra costs of PH design were based on a NYSERDA study for a tall building project and didn't factored in the incentives provided by the state of Massachusetts outlined in the DOER comments. I therefore have several objections to the conclusions reached by the developer:

a)Contrary to what the developer stated in the response to DOER, the NYSERDA study *FXFOWLE Podium: Feasibility of Implementing Passivhaus Standard for Tall Residential Buildings* https://issuu.com/fxfowle/docs/fxfowle_podium_passivehouse praises PH design even for tall buildings, and recognizes the merits of PH design to reduce carbon pollution. Coincidentally, New York City just inaugurated a tall PH building https://www.metropolismag.com/architecture/passive-house-cornell-tech/.

b) US2 seems to have completely disregarded the DOER analysis on costs and benefits of PH, and the information on incentives provided by the state, which included "split incentives" for rental units. The DOER analysis provides payback time periods that are much reduced than the 24 years stated by the developer on its response. Therefore, the rejection of the efficient and resilient PH design by the developer is deeply flawed, and the statements provided in 7.2.3 that US is 'committed to aggressive GHG reduction' rings hollow. The proposal to reduce buildings' energy consumption only by 14% compared to the base case is insufficient given the scale of the project and the magnitude of its impacts in terms of carbon emissions. At a minimum, the developer should strive for energy use intensity that is at least twenty-five percent (25%) below ASHRAE 90.1 2010, to be more aligned with the proposed City zoning standards (https://www.somervillezoning.com/), the Climate Forward Plan and with the 2050 carbon neutrality goals set by Mayor Curtatone. PM.7

I understand that changing the design of D2.2 and D2.3 to meet PH standards at this point might be difficult, but US2 must commit to plan for PH design at least for the

affordable housing of D4.3, because of the opportunity to lower energy costs for low-income residents. PH building standards are increasingly used for affordable housing; for example, they have been incentivized by Pennsylvania for the state's QAP.

The Climate Forward Plan also makes explicit reference to PH in Action 1 (net -zero and resilient new building standards).

a. Priority Action: *Adopt Flood and Extreme Heat Resilience Standards for New Construction, (see Performance Metrics, p. 25, for mention of PH design)*

Efficient building design such as PH that cuts carbon pollution *by a factor of 5* should be embraced by the developer to bring benefits to the community and to build competitive advantage. By rejecting the idea of PH design, US2 is shifting the burden of pollution and energy costs to the future residents and tenants on Union Square, and likely hindering the progress of the Commonwealth's statutory obligation to meet the greenhouse gases reduction goals established by the GWSA law. I would like to see a stronger commitment by US2 to use more energy efficient and climate resilient building standards in the final version of the EIR, especially for buildings that are planned in the years to come. PM.8

PM.1 **The final version of this EIR should establish a clear process and accountability measures for how the Proponent will comply with existing and future requirements to protect the health of the Union Square residents and workers. There must be a clearly stated commitment by the developer to be willing to rescale and repivot current plans based on future circumstances, e.g., unknown sources of contaminants in soil or similar issues.**

US2 intends to perform environmental assessments including subsurface investigations at each of the Lots prior to acquisition. As new data are obtained and/or new conditions are encountered, this information will be incorporated into the applicable regulatory submittals and used to evaluate risks to health, safety, public welfare, and the environment. If new conditions are identified that require regulatory notification, the applicable regulatory agencies (MassDEP and/or EPA) will be notified, and the appropriate response actions will be performed. Redevelopment activities will be performed in accordance with all local, state, and federal regulations. As such, A Condition of No Significant Risk of harm to human health, safety, public welfare or the environment will be achieved, thus being protective of future workers and/or residents at the site.

PM.2 **However, the developer failed to explore other ways of reducing density that would sacrifice neither housing or laboratory space, for example, by choosing to locate some of the parking garages underground. This choice would free up precious land that could be dedicated to open space, as demanded by the Council and by other citizens, and, would reduce density without sacrificing housing or other commercial developments.**

As part of preparing the additional alternatives presented in the DEIR, US2 considered the goals of the overall Project, the requirements of the Union Square Zoning and the feasibility of the alternative development scenarios. Throughout the Project planning process, a primary objective for Union Square's revitalization was to create commercial spaces, jobs and commercial taxes. In furtherance of this goal, the ratio of commercial to residential mix for the overall development was heavily discussed during the Board of Alderman's approval of the Union Square Zoning. Ultimately, the City's Union Square Zoning set a requirement that 60% of the Project must be commercial development. As such, US2 did not consider reduced density alternatives that decreased the amount of commercial space, and instead focused on reduced residential space to realize the requested "reduced build" scenario.

While moving more parking underground may reduce density as to the portion of improvements that are above ground, as suggested in the comment, and reduction of density can indirectly lead to certain environmental benefits (although it can also lead to reductions in benefits), it does not result in a reduction in the density of the occupied uses that generate environmental impacts generally speaking. In addition, while the Project includes above-grade parking in some locations, the Project also includes the provision of below-grade parking on portions of D1, D3 and D6, where below-grade parking appears

feasible. The feasibility of underground parking is very much site dependent and is not universally included in new developments in the metro area, particularly in suburban locations and in locations subject to flooding. Feasibility depends on the construction cost, site risks and the market conditions, among other factors will be evaluated as individual Lots are developed. The construction costs include the premium costs associated with underground construction (e.g., excavation, shoring, dewatering, environmental remediation, etc.) as well as the cost of other benefits provided by the Project. The market conditions include the rents that can be achieved for uses in this location. Given these considerations, the "reduced build alternative" did not include any additional below-grade parking.

The Project master plan includes the provision of underground parking on portions of D1, D3 and D6 where below-grade parking appears feasible. Soil contamination, water table location and soil conditions all influence the feasibility of underground parking. Most of the parking garages proposed within the Project master plan are located below the footprint of proposed buildings. Therefore, relocating those parking garages underground will have minimal impact on the amount of open space provided. For additional information regarding the considerations related to underground parking, please see the response to comment USNC.2, above.

PM.3 **The developer did not respond to the specific encouragement to design open space in a way that minimizes exposure to air pollution, a problem that directly applies to the D2 layout.**

The proposed location of the D2 plaza was arrived at through a lengthy public review and planning process, including the process that resulted in the approval of the CDSP. This extensive process included multiple rounds of neighborhood and stakeholder meetings, multiple public hearings, review by planning staff and the Planning Board, and approval of the CDSP, which specifies that the plaza on D2 be located along Prospect Street, where it lines up with the long-planned entrance to the future Union Square Station. The approval of the CDSP followed earlier extensive planning efforts that resulted in *SomerVision* and the Neighborhood Plan, again with many public meetings and hearings.

The D2 plaza is part of the initial Project phase, and since the ENF was filed US2 has been refining D2's design through the City's DSPR process. As part of the D2 planning process, notwithstanding the fact that the location of the D2 plaza was previously evaluated and approved as part of the CDSP process, certain community members suggested that the design of the plaza should be significantly revised in light of concerns regarding pollution impacts from vehicles on Prospect Street. More specifically, these members of the community suggested that US2 consider an alternative plan that would require a significant reconfiguration of the D2 design, an amendment to the CDSP, to accommodate a proposal to move the D2 parking structure underground, situate the plaza in the center of the D2 site and locate a building between Prospect Street and the plaza.

It was suggested that this reconfigured design would serve to minimize certain vehicular pollution impacts on users of the plaza.

As noted in the DEIR, US2 has studied the community proposed alternative, evaluated 'pros' and 'cons', and estimated the cost of the underground parking solution. One of the 'cons' identified was that the revised plaza location is not centered on the pedestrian access to Union Square Station, and the reconfiguration would require pedestrians accessing the station via the 'at-grade' accessible route to travel further. The reconfigured design would also result in making the plaza area less visible from the street, potentially creating concerns about whether users of the space would perceive it as secluded or unsafe.

To further understand the alternative design proposed by certain members of the community, the City hired a third-party construction estimating consultant to estimate the cost of the alternative and some variants. Ultimately, the premium cost of the alternatives was cost prohibitive. The Project is not able to absorb the additional cost, in addition to all of the other Project benefits outlined herein, and remain financially viable. Project feasibility is further challenged by increased risk, significant schedule delay and design challenges associated with implementation of the alternative plan.

Given the challenges associated with moving the parking underground on D2, and the infeasibility of that approach, which would result in significant delays and substantial costs, US2 revised the civic open space design in other ways to make it more resilient to vehicular pollution impacts. The width of the D2 civic open space has been increased to create greater horizontal separation from the civic open space areas most likely to be populated by pedestrians to Prospect Street vehicles. The elevation of the plaza has also been set at approximately the same elevation as the adjacent Union Square Station, allowing the southern approximately 150 feet of the plaza to benefit from being more than seven vertical feet below Prospect Street. The largest portion of the plaza, where people are most inclined to congregate, is at the southern end of D2 and benefits from the most vertical separation from Prospect Street (approximately 10 to 14 vertical feet). A vegetated landscape buffer has also been planned between the Prospect Street sidewalk and the main pedestrian areas of the plaza to further separate main pedestrian areas on the plaza from vehicles. Additional information regarding the D2 civic open space can be found in Section 1.2.4.4.

PM.4 **According to a city sponsored study mentioned in that letter, the recommended 'parking ratio' is 0.47, corresponding to less than 1,200 new parking spaces added (note that 1200 parking spaces corresponds to a ratio of 0.48). The City should demand that US2 adheres to the original parking ratio value of 0.47, by reducing the amount of parking to disincentivize car usage and take full advantage of the Green Line Extension. By its own admission, the developer used peak parking demand to decide how much parking is needed, a choice that goes against the 'Smart Growth' principles of section 1.1 of the DEIR; in addition, the developer promised to favor pedestrians, bicycles and**

public transportation (page 4-1). If that is true, parking garages need to be scaled down. Therefore, there is a disconnect between the US2 claim of 'reducing the demand for and the use of cars' with the proposal to build ~300 more parking spaces than what is recommended by the very Mobility Management Plan.

The approved Union Square Zoning Overlay District includes a carefully considered parking policy that requires a shared parking strategy, permits a maximum of 1,500 total parking spaces, and has no required parking minimum ratios. The proposed Project and its transportation demand management approach is responsive to this policy and includes 1,495 proposed parking spaces. The proposed parking levels are based on developing a mix of Project uses, operating shared commercial parking facilities and the commercial parking management strategy outlined in the DEIR. Please see Section 4.5.6 of the DEIR for more information regarding the parking plan and Section 2.3 of the FEIR for more information regarding the shared parking model.

In an effort to encourage a higher rate of shared vehicle use as requested by the commenter, the Project will provide approximately 14 of parking spaces dedicated to car sharing, and US2 has agreed to provide additional incentives for car sharing services for every residential unit.

The comment letter notes that the City sponsored a study recommending a ratio of 0.47 "parking spaces to households" which would correspond to less than 1,200 spaces for the proposed development program. US2 is not aware of that specific report, but the Project is targeting ratios of approximately 0.2 to 0.45 per unit for the residential portion of the Project which is less than the ratio cited. As noted in the DEIR, the residential portion of the mixed-use Project is approximately 40% of the planned development program and the other 60% is commercial uses. The ratio does not appear to consider commercial space, which typically has a higher parking ratio than residential spaces (see ITE Parking generation described in Section 4.5.6 and Appendix B-8 of the DEIR for comparative purposes).

Lastly, as noted above, the DEIR included an unshared parking analysis that was completed using the ITE Parking Generation manual, 4th edition. A summary of this analysis was included in Appendix B-8 of the DEIR, and shows that the potential demand if parking were unshared and not managed as described in the DEIR, could be over 4,800 parking spaces. The parking ratios proposed for the Project are below transportation industry standards.

PM.5 **Locating parking garages underground and covering those surfaces with more green space would also increase the climate resilience of the area.**

The Project master plan includes the provision of underground parking on portions of D1, D3 and D6 where below-grade parking appears feasible. Soil contamination, water table location and soil conditions all influence the feasibility of underground parking. Most of

the parking garages proposed within the Project master plan are located below the footprint of proposed buildings. Therefore, relocating those parking garages underground will have minimal impact on the amount of open space provided. For additional information regarding the considerations related to underground parking, please see the response to comment USNC.2.

PM.6 **The access compliancy with the American with Disabilities Act (ADA) needs to be addressed.**

Section 1.2.4.4 includes additional details and plans related to the D2 civic open space proposed along Prospect Street and how it will provide access to the station. Figure 1-8 is a detailed site plan for the civic open space, and Figure 1-9 depicts D2 site circulation for various modes of travel, including pedestrian and bicycle facilities. Section 1.3 further discusses the coordination between US2 related to GLX, and the improvements and amenities that US2 has agreed to provide in connection with Union Square Station. Figure 1-21 identifies the location and design of all amenities US2 will be providing in connection with the MBTA station, including: MBTA operator's breakroom, accessible restrooms, and janitor's closet; The Ride para-transit drop-off area; bicycle parking and the ADA-compliant access across the D2 civic open space to the station. Figure 1-10 identifies proposed grades and specific features of the civic open space. The portion of the civic open space that provides the ADA-compliant path will be a material consistent with MBTA standards and will designed to ADA standards for minimum width, longitudinal slope and cross slope.

PM.7 **At a minimum, the developer should strive for energy use intensity that is at least twenty-five percent (25%) below ASHRAE 90.1 2010, to be more aligned with the proposed City zoning standards (https://www.somervillezoning.com/), the Climate Forward Plan and with the 2050 carbon neutrality goals set by Mayor Curtatone. Should also look more at Passivehouse. US2 must commit to plan for PH design at least for the affordable housing of D4.3.**

The MEPA analysis uses AHSRAE 2013 as amended by the Massachusetts State Energy Code as its baseline, as required by the GHG Policy. AHSRAE 2013 as amended by the Massachusetts State Energy Code provides a significantly more stringent energy baseline than ASHRAE 2010. The Project's planned energy use intensities range between 15% to 25% below ASHRAE 2013 and the Massachusetts State Energy Code Amendments.

As suggested by the commenter, US2 has committed to building D4.3 as a Passive House project. This demonstration project will contribute to Somerville's sustainability goals and help establish a Passive House market in Massachusetts. The FEIR also contains a thorough Passive House analysis of the multi-family residential buildings. US2 will continue to leverage the D4.3 experience and these studies to further evaluate other residential projects for Passive House as they are developed. Please refer to Section 3.4 and Appendix E for details.

Chapter 3 also studies additional electrification studies and describes the approach to meeting the City's 2050 carbon neutrality goals. Lastly, it outlines US2's commitments to PV set-asides on rooftops and Green Vehicle infrastructure as additional measures to build toward carbon neutrality.

PM.8 **I would like to see a stronger commitment by US2 to use more energy efficient and climate resilient building standards in the final version of the EIR, especially for buildings that are planned in the years to come.**

The FEIR contains details of the proposed Project's energy efficient and climate resilient building designs, including all better-than-prescriptive code level building envelopes. A thorough evaluation of electric systems has been included. While the anticipated lab uses in a number of proposed buildings make a Project-wide commitment to all-electric systems impossible, electric systems are anticipated to be incorporated throughout the project where appropriate and financially viable. This will ultimately depend on the tenant mix of each building. Please refer to Section 3.3 for an analysis of electric systems including GHG reduction benefits and cost paybacks.

Additionally, this FEIR contains a thorough Passive House Analysis of the multi-family residential buildings. Please refer to Section 3.4 and Appendix E for details. Passive House will be considered for all residential buildings built in Phases 2, 3-South and 3-North. Passive House principles are proposed in current designs across Union Square.

Provided its unique suitability, and prime location near the future Union Square Station, US2 will commit to delivering the multi-family building on D4.3 as a Passive House Project. Please refer to Section 3.4 for details.

Somerville Catholic Collaborative
Patronage of St. Joseph (1869)
St. Catherine of Genoa Church & School
St. Ann's Parish

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February 14, 2019 {St. Valentine's Day}

Secretary Matthew A. Beaton
Exec. Office of Energy & Environmental Affairs
Attn: Alex Strysky
100 Cambridge Street, Suite 900
Boston, MA. 02114

RE: Union Square Redevelopment Project (EEA# 15889) Draft Environmental Impact Report (DEIR)

Dear Secretary Beaton:

As a appointed member of the Civic Advisory Committee in Somerville and having taken part regularly in the various meetings related to city redevelopment over the past five years or more, I would like to offer some observations and comments related to the Union Square Redevelopment Project and GLX MBTA extension plans for this area. In particular, I would like to address issue raised in the Draft Environmental Impact Report (DEIR) presently under consideration.

As you know, Union Square is a destination of unique historical significance. Unlike other redevelopment sites in the area, e.g., Boston Seaport and Cambridge Crossing/Northpoint, this neighborhood is not a former warehouse/parking lot area nor is it a former railroad yard but rather Union Square has a rich historical and industrial heritage as well as being one of the most densely populated regions of the nation. The Patronage of St. Joseph parish will be celebrating 150 yrs this year as a community of faith which has been a strong part of the area's memories. The tri-parish collaborative with St. Ann's (Gilman Square) and St. Catherine's (Spring Hill) today supports a remaining school and homeless shelter among other ministries.

One need only walk around the square to encounter monuments to Mr. James Miller – a hero of the Battle of Bunker Hill (1776) as well as a monument across from St. Joseph's church to the recruitment efforts for the Union Army during America's Civil War; not to mention, the wall painting (Barrister's Bldg) and tower on Prospect Hill displaying the Grand Union Flag and General Washington's acceptance of the command of the Continental Army here on Jan. 1, 1776. Few areas in the country are so closely tied to the nation's history. No wonder Prospect Hill is mentioned several times in David McCullough's book, 1776, as well as in Nathaniel Philbrick's work on Bunker Hill.

Battle of Menotomy - First Blood, 1775 | HistoryNet
www.historynet.com/battle-of-menotomy-first...
Again Percy brought his cannon into play and sent his 47th Regiment up the hill. The Americans fired a few rounds and then retreated—all but 65-year-old James Miller, whose house sat just downslope. Saying he was "too old to run," Miller stood his ground, firing steadily at the oncoming British until cut down. .....

It is important, therefore, that any major transportation terminus (there is some talk of extending the Green Line to Porter Square in the future) should be a major gateway and welcoming point to the retail, commercial, research and residential neighborhood which is being transformed, hopefully, for a further chapter in history. Lessons such as those learned from Boston's West End where a residential community was distroyed (c.f. Actor Leonard Nemoy's account) save for St. Joseph's Church should be appreciated as we appreciate thee potential for growth but also for preservation while we move forward.

Unfortunately, the plans for the D2 lot on the corner of Prospect and Washington Streets, leave a lot to be desired in terms of a 'welcoming gateway'. US2 (Magellan & Mesirow) refers to USQ has outlined an area with a 25-storey residential condo unit and various 10 storey high research lab facilities as well as office and retail space. The focus of USQ apprears to be limited without linkage to the surrounding residential and historic areas.

For instance, riders on the GLX extension will be 'unloaded' onto a back lot with a vision of a three or more storey above ground parking garage like so many ugly industrial lots around the city. These 'guests' or regular riders then are expected to 'walk around' the buildings up a gradual slope parallel to the very busy and polluted exhaust fumes of Prospect Street. SCC1.1

Rather than have an elevator on each side of Prospect Street on the bridge which would lower the elderly, children and the physically challenged onto an MBTA platform, users are apparently expected to travel down a steep grade to the corner of Prospect and Washington before re-tracing their steps toward the MBTA station itself. This must be in conflict with guidelines for the handicapped which would apply to this situation. Granted that the area descibed probably comes under the jurisdiction of the MBTA, as well as state and city regulations. SCC1.2

Will there be drop-off and pick-up of passengers on this Prospect St. bridge area and will there be a turn-in area to accomplish this task? I think that most would agree on the overloading of our streets, bicycle and pedestrian safety and congestion [We just had a hit-run accent of a Ms. Allison Donovan on Powderhouse Blvd. last week and bicycle accidents are recorded for Bow St., Prospect St. in Cambridge (fatality), while Beacon St. into Inman Square is said to be one of the State's most dangerous roadways. SCC1.3

At the same time, it's my understanding that one or two empty MBTA cars will be stationed at the end of the tracks near the Prospect Street bridge. I seems that this dark area where in-going passengers to Lechmere might be invited to cross the tracks for boarding will be a potential eye-sore and crime scene open to potential drug users and neighbor problems—as will the area surrounding the Electric Generators up on Webster Ave. and Everett St. beyond those already experienced in the area.

Two or three alternate designs for the D2 lot were suggested by experienced and trained designers such as Tim Talun, Prof Anne Tate (whose husband, the Rev. Bob Massie—an Anglican minister in Somerville who recently ran in the primary for governor) and Bill Cavillini as well as Wig Zamore. These thoughtful plans sought to move the station platform further down the line away from the Prospect Street bridge so that the sight lines and access routes would be leveled inviting the newcomer into a vision of Propect Hill and Union Square. SCC1.4

According to these plans, the three storey parking garage would be placed below ground or even off-site stradling the MBTA tracks and having access to the Boynton Yard region with roof-top playing fields. If the contaminated brownfields residue known to exist in the D2 area where properly removed and remediated with due consideration for its final disposal, this would also help to assure down to the clay subsoil a proper safe cleansing of this former industrial area. Granted an underground parking area might initially be more expensive; however, it seems that two proposed multi-story buildings on the Beacon Roofing site at the corner of Webster and Prospect Streets and another building in Boyton Yards are both said to include underground parking given similar soil and water conditions. SCC1.5

One wonders also how the present DQ/D2 designs conform to the city's long-term designs such as Somervision. According to this projection, the city is aiming for 125 acres of open space in one of the nation's most congested living areas and yet little regard or accommodation is made for such public accessible areas on this redevelopment lot. Sustainability and run-off water drainage issues remain an issue especially in the Union Square area which has been known to be the site of extensive flooding in the past although recent infrastructure improvements have, hopefully, remediated the problem. [St. Joseph's lower church experience $180,000 flooding damage (7/28/14) after the tornado in Revere Beach about five years ago.] Green grass and parks can help to offset water runoff issues. SCC1.6 SCC1.7

Presently, Fr. Properzi towers on Warren Ave. at 11 stories height is the tallest building in the square—named after the founder of St. Anthony's parish on Somerville Ave. next door. But three or more condo units in Union Square, on the D2 lot and in Boyton Yards threaten to raise a shadow concern in relation to the East/West alignment of Washington Street which can be blinding during morning and evening rush hour. Similar issues had to be address at downtown crossing/Arch Street Winthrop Square Tower regarding shadows on the Boston Common and the Old South Church in Copley Square threatened legal issues over shadows effecting their area of worship.

Another major concern which has been expressed by several individuals refers to the proposed 'access road' which will run parallel to the Allen Street residents. Apparently, day and night, delivery trucks will drop off and pick up materials related to operations on the D2 lot. Little consideration or consultation has been down with the long-term occupants or the rental and privately-owned properties which are sandwiched between the DQ and Target Department story areas. Independently, CAAS and CSS are exploring with the 112 yr. Somerville YMCA SCC1.8

and CHA as well as the Somerville Public Library and Somerville Media the potential for relocating their facilities to this area which would mean the demolition of two 15-year old properties which accommodate a CAAS Headstart Program and a mixed-use SCC affordable housing development. Regretably, these public-service resources would be hidden in a back lot without Washington Street or Somerville Ave. frontage as opposed to previous suggestions that such facilities might be placed on the public safety lot which presently houses our main police station and a branch fire unit on Washington Street. The public safety building would have great visibility and access both on the Somerville Ave. as well as the Washington St. side of the building lot and would allow for some public access green space as proposed on Miriam Street.

Once again, this whole Allen St. to Target residential area seems to be more of a patchwork overlay rather than part of a well-thought out long term design effort. The residents don't seem to have been consulted with due diligence and their interests appear secondary to the city's and the developers immediate interests. Some have pointed out that this area will be a 'gold fish bowl' surrounded by high rise buildings and chocking off the living space for many long-time Somerville natives.

At the same time, Royal Hospitality Laundry on the corner of Webster Ave. is rumored to have obtained the bid on the Encore Casino operation which promises to double the workload assuming this facility remains in its present location. The $2.5+ billion Casino is only two miles away from Union Square over the line in Everett near Sullivan Square and the implications for increased traffic and congestion clogging the roads and adding to pollution in the immediate area.

All of these issues briefly outline the several concerns reflecting quality of work space, safety, livability and expansion/enhancement of a major american settlement which falls in the shadow of Kendall Square that is regarded as the 'Innovation Hub of the East Coast of the USA'. I hope our state officials will ponder not just the short-term profits but rather the longrange gains of moving ahead after wise consideration of all the factors involved in redevelopment.

Sincerely,

Fr. Richard G. Curran

Fr. Richard G. Curran, Ed.D.

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Somerville Catholic Collaborative
Patronage of St. Joseph (1869)
St. Catherine of Genoa Church & School
St. Ann's Parish

February 14, 2019 {St. Valentine's Day} & Feb. 25, 2019

Secretary Matthew A. Beaton
Exec. Office of Energy & Environmental Affairs
Attn: Alex Strysky
100 Cambridge Street, Suite 900
Boston, MA. 02114

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As an appointed member of the Civic Advisory Committee in Somerville and having taken part regularly in the various meetings related to city redevelopment over the past five years or more, I would like to offer some observations and comments related to the Union Square Redevelopment Project and GLX MBTA extension plans for this area. In particular, I would like to address issue raised in the Draft Environmental Impact Report (DEIR) presently under consideration.

As you know, Union Square is a destination of unique historical significance. Unlike other redevelopment sites in the area, e.g., Boston Seaport and Cambridge Crossing/Northpoint, this neighborhood is not a former warehouse/parking lot area nor is it a former railroad yard but rather Union Square has a rich historical and industrial heritage as well as being one of the most densely populated regions of the nation. The Patronage of St. Joseph parish will be celebrating 150 yrs this year as a community of faith which has been a strong part of the area's memories. The tri-parish collaborative with St. Ann's (Gilman Square) and St. Catherine's (Spring Hill) today supports a remaining school and homeless shelter among other ministries.

One need only walk around the square to encounter monuments to Mr. James Miller – a hero of the Battle of Bunker Hill (1776) as well as a monument across from St. Joseph's church to the recruitment efforts for the Union Army during America's Civil War; not to mention, the wall painting (Barrister's Bldg) and tower on Prospect Hill displaying the Grand Union Flag and General Washington's acceptance of the command of the Continental Army here on Jan. 1, 1776. Few areas in the country are so closely tied to the nation's history. No wonder Prospect Hill is mentioned several times in David McCullough's book, 1776, as well as in Nathaniel Philbrick's work on Bunker Hill.

Battle of Menotomy - First Blood, 1775 | HistoryNet
www.historynet.com/battle-of-menotomy-first...
Again Percy brought his cannon into play and sent his 47th Regiment up the hill. The Americans fired a few rounds and then retreated—all but 65-year-old James Miller, whose house sat just downslope. Saying he was "too old to run," Miller stood his ground, firing steadily at the oncoming British until he was cut down. .....

It is important, therefore, that any major transportation terminus (though there is some talk of extending the Green Line to Porter Square in the future) should be a major gateway and welcoming point for the retail, commercial, research and residential neighborhood which is being transformed, hopefully, adding a further chapter to our history. Lessons such as those learned from Boston's West End where a residential community was destroyed (e.g. Actor Leonard Nimoy's account) save for St. Joseph's Church should be appreciated as we anticipate the potential growth as well as preservation of national landmarks.

Unfortunately, the plans for the D2 lot on the corner of Prospect and Washington Streets, leave a lot to be desired in terms of a 'welcoming gateway'. US2 (Magellan & Mesirow) also referred to as USQ has outlined an area with a 25-storey residential condo unit and various 10 storey high research lab facilities as well as office and retail space. The focus of USQ apprears to be limited to the area of construction without linkage to the surrounding residential and historic areas.

For instance, following the US2 plan, riders on the GLX extension will be 'unloaded' onto a back lot with a vision of a three or more storey above ground parking garage like so many ugly industrial lots around the city. These 'guests' or regular riders then are expected to 'walk around' the buildings up a gradual slope parallel to the very busy and polluted exhaust fumes of Prospect Street.

Air pollution has always been a concern since the 'Big Dig' diverted increased traffic beyond the tunnel outlets. Tufts University, which has been involved in researching this issue in the past, has just announced a new study and $779,935 grant from the Dept. of Housing and Urban Development to improve indoor air quality for residents living in multifamily complexes near busy roads. The June, 2019 opening of Encore Casino which is just two miles away from Union Square in Everett will, no doubt, exacerbate the problem. ["Somerville at Center of New Study on Air Quality: Tufts to Research Traffic Pollution." Boston Sunday Globe. 2/24/19 p. N)

Rather than have an elevator on each side of Prospect Street on the bridge which would lower the elderly, children and the physically challenged onto an MBTA platform, users are apparently expected to travel down a steep grade to the corner of Prospect and Washington before re-tracing their steps toward the MBTA station itself. Is there sufficient room on the Prospect St. bridge for a bus turnout to pick up and drop off passengers? This must be in conflict with guidelines for the handicapped which would apply to this situation. Granted that the area descibed probably comes under the jurisdiction of the MBTA, as well as state and city regulations which can complicate matters, accessibility seems to be an obvious area of concern.

Will there be drop-off and pick-up of passengers on this Prospect St. bridge area and will there be a turn-in area to accomplish this task? I think that most would agree on the importance of not overloading of our streets, bicycle and pedestrian safety and the dangers of congestion [We just had a hit-run accident resulting in the death of a Ms. Allison Donovan on Powderhouse Blvd. last week and bicycle accidents are recorded previously for Bow St., Prospect St. in Cambridge (fatality), while the route from Beacon St. into Inman Square is said to be one of the state's most worrisome roadways for bicylists.]

At the same time, it's my understanding that one or two empty MBTA cars will be stationed at the end of the tracks near the Prospect Street bridge. I seems that this dark area where inbound passengers to Lechmere might be compelled to cross the tracks for boarding will be a potential eye-sore and crime scene open to potential drug users and neighbor problems—as will the area surrounding the Electric Generators near Webster Ave. and Everett St. beyond those already experienced in this area.

Two or three alternate designs for the D2 lot were suggested by experienced and trained designers such as Tim Talun, Prof Anne Tate (whose husband, the Rev. Bob Massie—an Anglican minister in Somerville who recently ran in the primary for governor) and Bill Cavillini as well as Wig Zamore. These thoughtful plans (https://tiinyurl.com/d2alternative) sought to move the station platform further down the line away from the Prospect Street bridge so that the sight lines and access routes opening into the neighborhood would be leveled inviting the newcomer into a vision of Propect Hill and Union Square's wider potential.

According to these alternative plans, the three storey parking garage would be placed below ground or even off-site stradling the MBTA tracks and having access to the Boynton Yard region with roof-top playing fields. If the contaminated brownfields residue known to exist in the D2 area were tp be properly removed and remediated down to the clay subsoil with due consideration for its final disposal, resulting in a proper safe cleansing of this former industrial area. Granted an underground parking area might initially be more expensive; however, it seems that two proposed multi-story buildings on the Beacon Roofing site at the corner of Webster and Prospect Streets and another building in Boyton Yards are both said to include underground parking given similar soil and water conditions. [From Page 3 and 5 and 13 of Somerville Planning and Zoning Decisions – Page 3 links are important https://www.somervillema.gov/departments/ospcd/planning-and-zoning/reports-and-decisions This development was initially put forward by DLJ but now has Leggat McCall also involved.]
[https://outlook.live.com/mail/id/AQMkADAwATYwMAItOGU4Yi1hNmRkAC0wMAItMDAKAEYAAAMnNv6aM7t7Saaj2PBEwWHdBwAf6QoxhikSRpRZQFI2eXDCAAACAQwAAAAf6QoxhikSRpRZQFI2eXDCAAJenoTmAAAA/sxs/AQMkADAwATYwMAItOGU4Yi1hNmRkAC0wMAItMDAKAEYAAAMnNv6aM7t7Saaj2PBEwWHdBwAf6QoxhikSRpRZQFI2eXDCAAACAQwAAAAf6QoxhikSRpRZQFI2eXDCAAJenoTmAAAAARIAEADEDdxF9mFQTb6RL8ASz4EN]

One wonders also how the present USQ/D2 proposals conform to the city's long-term designs such as SomerVision and the Union Square Neighborhood Plan. According to these projections, the city is aiming for 125 acres of open space in one of the nation's most congested living areas and yet little regard or accommodation is made for such public accessible areas on this redevelopment lot. Sustainability and run-off water drainage issues remain an issue especially in the Union Square area which has been known to be the site of extensive flooding in the past although recent infrastructure improvements have, hopefully, remediated the problem. [St. Joseph's lower church experience $180,000 flooding damage (7/28/14) after the tornado in Revere Beach about five years ago.] Obviously, green grass and parks can help to offset water runoff issues.

Presently, Fr. Properzi towers, named after the founder of St. Anthony's parish on Somerville Ave., on Warren Ave. at 11 stories height is the tallest building in the square. However three or more condo units in Union Square, on the D2 lot and in Boynton Yards threaten to raise a shadow concern in relation to the East/West alignment of Washington Street which can be blinding during morning and evening rush hour. Similar issues had to be addressed at downtown crossing/Arch Street with the Winthrop Square Tower regarding shadows on the Boston Common and the Old South Church in Copley Square which threatened legal issues over shadows effecting their area of worship. One would hope that other concerns, such as LEEDS compliance, energy efficiency, fire-safe cladding and down drafts surrounding high rises would also be taken into consideration. SCC1.9

Another major concern has been expressed by several persons refers to the proposed 'access road' which will run parallel to Allen Street. Apparently, we have no reason to doubt that day and night, delivery trucks will drop off and pick up materials related to operations on the D2 lot. Little consideration or consultation has been done with regard to the long-term occupants or the rental and privately-owned properties which are sandwiched between the USQ and Target Department story. Independently, the Somerville Community Corp. (SCC) has been promoting a plan to build a community center and residential complex along Charlestown St. between Allen and Merriam and has engaged with a number of other organizations including CAAS, the Somerville YMCA, CHA, SMC (SCATV), and the Somerville Public Library, urging them to think about locating facilities which they would operate in this area which would mean the demolition of two 15-year old properties that presently accommodate a CAAS Headstart Program and a mixed-use SCC affordable housing development.

Regrettably, these public-service resources would be hidden in a back lot without Washington Street or Somerville Ave. frontage as opposed to previous suggestions that such facilities might be better placed on the public safety lot (D1) which currently houses our main police station and a branch fire unit on Washington Street. The public safety building would have great visibility and access both on the Somerville Ave. as well as the Washington St. side of the building lot and would allow for some public access green space as proposed on Miriam Street not to mention on-site parking garage potential.

Once again, this whole Allen St. to Target residential area seems to be more of a patchwork overlay rather than part of a well-thought out long term design effort. The residents don't seem to have been consulted and their interests appear to be seen as secondary to the city's and the developer's immediate interests. Some have pointed out that this area will be a 'goldfish bowl' or a 'donut hole' surrounded by high rise buildings which would choke off the living space for many long time Somerville natives.

In addition, Royal Hospitality Laundry on the corner of Webster Ave. is rumored to have obtained the bid on the Encore Casino operation which promises to double the workload assuming this facility remains in its present location. The $2.5+ billion Casino is only two miles away from Union Square over the line in Everett near Sullivan Square and the implications for increased traffic and congestion clogging the roads and adding to pollution in the immediate area are evident.

All of these issues briefly outline the several concerns reflecting quality of work space, safety, livability and expansion/enhancement of a major american settlement which falls in the shadow of Kendall Square that is regarded as the 'Innovation Hub of the East Coast of the USA'. I hope our state officials will ponder not just the short-term profits but rather the long-range gains of moving ahead after wise consideration of all the factors involved in redevelopment and that serious remediation efforts and design corrections will take place.

Sincerely,

Fr. Richard G. Curran, Ed.D.

Fr. Richard G. Curran

Patronage of St. Joseph
264 Washington Street - Union Square
Somerville, MA. 02143-3313

Tel: (617)-666-4140 or 2087
Cell: (774)-269-2256

Community Benefits – Some Suggestions (not in order of priority):

1. **Foster local employment, small businesses, local ownership** – return more income locally innovation district – foster start-ups, Greentown Labs, Artist's Asylum, Mudflat Studios, etc. start-ups look for re-purposed factories/industrial areas for cheaper rents, etc—zoning helpful. Insofar as feasible, use union labor in construction. Accept 40/60% split for residential versus commercial/research lab development which would increase tax income for city but also encourage local employment, small businesses/restuarants and local ownership. Develop ongoing training programs in new high school and for re-tooling existing local workers/updating using resources of Bunker Hill Community College, Cambridge College, Univ. of Southern N.H. as well as UMASS, Lesley, Tufts, Harvard, and MIT with online courses available as well as hands-on experience.
2. **Affordable Housing** – 20% required for over 14-18 units of housing development – not displaced to other regions of town (ghettoized). Housing for families and children—not just millenials. (Avg Age 31.9) 12% of presently available affordable housing may disappear by 2020 according to Advocate(Fall, 2017)
3. **Environmentally Sustainable/friendly areas** – green and open spaces, rooftop gardens—incentives could encourage LEEDS compliant buildings and energy conservation, white roofs. Public parks and playing fields (not all 'pocket' parks)
4. **Pedestrian and traffic safety** – Inman Square/Beacon St., Prospect St., Bow St. are among most dangerous in MA for bike safety. Western Ave. beyond Central Square and Comm Ave at B.U. as well as Mass Ave. in Boston are models for possible bike-safe isolated lanes similar to Northern European bike-friendly environments. Self-driving autos are not immediately available and arrangements for parking (income source?) must be supplied. Drop-off/Pick-up areas for GLX doesn't allow two-way traffic, parking and bike routes on Prospect St.--curb cuts already into D2 station region—is this sililar to UMASS Boston Koskiewsko Circle nightmare in Dorchester?
5. **Infrastructure** – fiber optic cables, sewrage/run off drains to handle flooding issues in Union square, wiring for new developments. Water drainage from rain runoff must be isolated from treatment facility costs. High-tech commercial development mut be attracted by adequate technical support.
6. **Cultural & Artistic Enhancement of Area** –Arts & Community Resources
   Somerville already is a destination – music, art, culture, heritage, history walkable city vision encourages resources for arts, opportunities for enlightenment, 'funky'? flavor preserved?, Develop distinctive cultural aspects, ethnic celebrations, and vibrancy of neighborhoods/residents—not just sterile, empty buildings and parking spaces. Need street traffic, pedestrian shoppers/diners, cultural creativity for retail businesses/restuarants.
   c.f., New Boston Market at Haymarket and/or Eataly at Prudential food court.
7. **Branch Library/multi-function facility** similar to those shown on Chronicle Magazine TV in E. Boston, etc. innovative approaches to libraries as workspaces, maker areas, incorporate media resources which might include SCATV (Somerville Media Center) a market area (Ricky's Flowers?) as described in #6 along with area for senior center and day care opportunities for children. Allow for innovative public areas similar to New Boston Market (Haymarket MBTA) or Eataly at Prudential food court to increase foot traffic and service anticipated new workforce at commercial/lab facilities as well as local food and small business establishments. Refer to Halifax, Nova Scotia public library project and BPL renovations in the Johnson wing with WGBH studio and coffee shop, etc.
8. **Participatory Planning and Direct Community Involvement** – not just city appointees or 'content experts' Union Square has benefited from very generous and talented/experienced/trained experts on community development, city planning, transportation and the other issues such as business (chamber of commerce), unions, but there's a need for a direct voice representing (perhaps by direct vote) the feelings and thoughts of resident citizenry as well as local business stakeholders. Dr. Laurie Goldman and ' Dr. Pen Loo from Tufts represent just some of the professionals from Tufts, Harvard, MIT as well as academic student projects at these institutions which have focused on the re-development issues of Somerville over the years.

Preserve Historical Character & Heritage of Region (area is not a blank slate--'tabla rasa') rich history
Take into consideration Impact Studies (MEPA—Mass Environmental Protection Act) – brownfield remediation, flooding/drainage issues, rising tides, building shadows, noise, traffic safety, etc.
Affordable Housing (one of the most densely populated regions of country) – some housing reverting to market value/shrinking resource – Prospect Hill listed as 4th most expensive in country
how many family sized units? Not just single bedroom, micro/mini apartments/condosEEA#

1. **Union Square Neighborhood Plan - Somerville, Massachusetts by ...**
issuu.com/principleplaces/docs/union-square-np...
Union Square Neighborhood Plan - **Somerville, Massachusetts**
issuu.com/principleplaces/docs/union-square-np...
CITY OF **SOMERVILLE, MASSACHUSETTS**. Joseph A. Curtatone, Mayor. Dear Friends, This is a special moment in the history of both Union Square and our city as a whole.
SomerVision
https://www.govserv.org/US/Somerville/216062575074654/SomerVision%3A-Somerville%E2%80%99s-Comprehensive-Plan

Greater Somerville - Bill Shelton & Tim Talun - Union Square ...
www.youtube.com/watch?v=JianTmm1Xul
Join host KyAnn Anderson as she speaks with long-time community advocate and **Somerville Times** columnist Bill Shelton, and **Union Square** Neighbors chair and founding member **Tim Talun**, about US2 ...

- **Tim Talun - Union Square Neighborhood Council Candidate ...**
archive.org/details/**Tim_Talun_-_Union_Square**...
Tim Talun - Union Square Neighborhood Council Candidate Movies Preview ... Youtube-playlist Uploads from **Somerville** Media Center. Youtube-playlist-index 773.

- **Tim Talun - Union Square Neighborhood Council Candidate**
www.youtube.com/watch?v=0JWlf5rm8cY
This video is unavailable. Watch Queue Queue. Watch Queue Queue

- **Column: Create long-term plan for civic buildings in Union ...**
somerville.wickedlocal.com/article/20150623/NEWS/...
Recently **Union Square** Neighbors held a roundtable discussion attended by the Director of the **Somerville** Public Library, members of the Library Board of Trustees and the director of SCATV where we discussed their plans and thoughts about **Union Square** and future facilities for those organizations.

- **Tim Talun | Greater Somerville**
greater**somerville**.wordpress.com/tag/**tim-talun**
Join host KyAnn Anderson as she speaks with long-time community advocate and **Somerville Times** columnist Bill Shelton, and **Union Square** Neighbors chair and founding member **Tim Talun**, about US2 Associates recent development proposal for the D2 and D3 parcels in **Union Square**.

- **Union Square - Welcome to Somerville - mural in Union Square ...**
www.pinterest.com/pin/55169164154844622
Union Square - Welcome to **Somerville** - mural in **Union Square, Somerville, MA. Union Square** - my old neighborhood.

- **Billionaire real estate mogul buying Union Square properties ...**
www.wickedlocal.com/article/20140110/News/301109756
Billionaire real estate mogul buying **Union Square** properties in **Somerville** . Dan Atkinson and Monica Jimenez ... Both 2 and 9 **Union Square** are part of the D-6 block in **Somerville**'s **Union Square** ...

- **The Somerville Times**
www.the**somerville**times.com
On February 6, 2019, in Latest News, by The **Somerville** Times In 2019, Lyndell's Bakery located at 720 Broadway **Somerville, MA** celebrates its 132nd Anniversary opening for business in December of 1887.

City of Somerville **www.somervillema.gov/sites/default/files/2017-02...**
City of **Somerville Union Square** Zoning Amendment Meeting #8 2.07.17 City of **Somerville** ... • D1 is identified as a **High Rise** district in the proposed ordinance

Frequently Asked Questions, Union Square Public Benefits ...
smartgrowthamerica.org/program/locus/attainable...
After the adoption of SomerVision, the City launched a neighborhood planning process in Union Square ("**Somerville** by Design"). The neighborhood plan creates a vision not just for the seven D- Blocks, but for all of Union Square and **Boynton Yards**—collectively, approximately 429-acres.

1. Somerville to Open New Affordable Housing in Union Square ...
   patch.com/massachusetts/**somerville/somerville**...
   SOMERVILLE, MA – A new affordable housing building in **Union Square** will be unveiled at a ribbon cutting ceremony Thursday. The ceremony will take place at Nu Café, 195 Washington St., just down ...
2. Somerville Zoning – Zoning Overhaul Somerville MA
   www.**somervill**ezoning.com
   Somerville Zoning. Zoning Overhaul **Somerville MA**. Search for: ... **High-Rise** Districts ... City of **Somerville** Main Site; **Union Square** Planning
3. Union Square (Somerville) - TripAdvisor
   - www.tripadvisor.com
   - › ...
   - › Things to Do in Somerville

   Union Square is on the upswing, but still has the variety (architecturally, cuisine-wise, etc) to please and intrigue. Especially in the food, and convenience store variety and experience. DunkinDonuts and one end, **high** end **Union Square** donuts at the other, Mexican, Portuguese, Indian, Chinese, American...
4. Somerville, Massachusetts - Wikipedia
   en.wikipedia.org/wiki/**Somerville**,_Massachusetts
   The 26th Middlesex district includes East **Somerville**, Brickbottom, and a portion of the **Union Square** area, as well as portions of Cambridge, The 34th Middlesex district includes Winter Hill and Teele **Square**, as well as portions of Medford. The remainder of the city, just over half, comprises the 27th Middlesex district, which does not extend ...

Somerville Zoning – Zoning Overhaul Somerville MA
www.**somervill**ezoning.com
Somerville Zoning. Zoning Overhaul **Somerville MA**. Search for: ... **High-Rise** Districts ... City of **Somerville** Main Site; **Union Square** Planning

- 181 Washington Street | Somerville Community Corporation

somervillecdc.org/181-washington-street
The **Union Square** Apartments at 181 Washington Street, **Somerville**, Mass., are a few blocks from the anticipated new Green Line stops at Washington Street and **Union Square**. The four-story property features 35 affordable residential units and 2,400 sq. ft. of ground floor commercial space.

- Somerville Bond Rating On The Rise: Moody's - Patch

patch.com/.../**somerville**-bond-rating-**rise**-moodys
Somerville Bond Rating On The **Rise**: Moody's ... Drivers of new growth include pending development in **Union Square** and new development at Assembly Row, according to Moody's. ... **MA** News Mexican ...

- Union Square Neighborhood Guide - Somerville, MA | Trulia

www.trulia.com/n/**ma/somerville/union-square**/227461
Discover what it would be like to live in the **Union Square** neighborhood of **Somerville, MA** straight from people who live here. Watch stories, review crime maps, check out nearby restaurants and amenities, and read what locals say about **Union Square**

- New Affordable Apartments Open in Union Square | Somerville ...

somervillecdc.org/...affordable-apartments-open-**union-square**

New Affordable Apartments Open in **Union Square** ... **MA**, January 5, 2017 – **Somerville** Community Corporation CEO Daniel LeBlanc and SCC's real estate team were ...

Big re-do of Somerville's Union Square gets a big investor ...
www.bostonglobe.com/business/2018/06/01/big...
A public plaza at at a lab and residential building planned along **Somerville** Avenue in **Union Square**. ... transforming its tangle of low-**rise** blocks into a new economic hub of **Somerville**.

1. **Design process for Somerville's Union Square leads to ...**
somerville.wickedlocal.com/article/20150316/NEWS/150317101
But they also presented designs for areas not covered in **Union Square**'s urban renewal plan, like a park and **high-rise** buildings in Boynton Yards, a library next to Target on **Somerville** Avenue and townhouses in front of Market Basket.
2. **Somerville Is Getting an Ax-Throwing Bar Because of Course It ...**
boston.eater.com/2018/1/11/16878842/urban-axes...
Share **Somerville** Is Getting an Ax-Throwing Bar Because of ... is expanding to the heart of **Somerville**'s **Union Square** ... the probable **high** cost. ...
3. **"Changing Face of Historic Union Square"**
s3.amazonaws.com/ifa.**somervillema**.gov/documents/...
reclamation in the marshy area on the south side of **Union Square** area -- **Somerville** Avenue was ... the **rise** of several industries near **Union Square**, ... **high** profile ...
4. **Partners HealthCare, development on rise in Assembly Square ...**
somerville.wickedlocal.com/news/20160721/partners...
Partners HealthCare, development on **rise** in Assembly **Square** . ... specifically **Union Square**. And he said they are on the track to make real progress ...

Design process for Somerville's Union Square leads to ...
somerville.wickedlocal.com/article/20150316/NEWS/150317101
But they also presented designs for areas not covered in **Union Square**'s urban renewal plan, like a park and **high-rise** buildings in Boynton Yards, a library next to Target on **Somerville** Avenue and townhouses in front of Market Basket.

1. **Somerville rezoning plan will make Union Square the city's ...**
archpaper.com/2017/06/**somerville**-rezoning...
In **Somerville**, Massachusetts, a $1 billion redevelopment scheme in the city's **Union Square** neighborhood is edging closer to happening after **Somerville**'s Board of Alderman waved through a ...
2. **City of Somerville, MA | Somerville High School Building Project**
archive.**somervillema**.gov/**high**school/central-hill...
City of **Somerville**, **MA**. ... Women of the **Union Square** Post Plaque Memorial 13. Civil War Memorial ... **Somerville High** Honor and Progress Plaque 7. Memorial Bench
Union Square, Somerville, MA 02143 | HotPads
hotpads.com/**somerville**-**ma**-02143-uts0yb/pad
Students who live in **Union Square** attend the following **Somerville** Public Schools ... **Somerville High** School. Public. ... ZIPs near 45 **Union** Sq **Somerville MA**. 02145 ...

1. **Somerville - Union Square - workbar.com**
www.workbar.com/location/**somerville-union-square**
31 **Union Square**, **Somerville**, **MA** 02143 Schedule a Tour. ... **High** Speed Wifi. Nursing Rooms. Meeting and Huddle Rooms. Event Programming. Technology Platform. 24/7 Access.

2. Somerville, Massachusetts (MA) Zip Code Map - Locations ...
www.city-data.com/zipmaps/**Somerville**-Massachusetts.html
According to our research of Massachusetts and other state lists there was 1 registered sex offender living in 02138 zip code as of February 06, 2019. The ratio of number of residents in zip code 02138 to the number of sex offenders is 37,598 to 1.

3. Union Square – SomervillebyDesign
www.**somerville**bydesign.com/.../**union-square**
2015 APA-**MA** Annual Planning Award Recipient. Comprehensive Planning Award: **Union Square** Neighborhood Plan Preparing for the future extension of the MBTA Green Line, the **Union Square** Neighborhood Plan examines growth opportunities in **Union Square, Somerville**.

4. Somerville Winter Farmer's Market - Somerville, MA - Yelp
www.yelp.com/biz/**somerville**-winter-farmers...
The winter iteration of the highly excellent **Union Square** Farmer's Market is, unsurprisingly, also worthy of recognition. ... **MA** Hi-**Rise** Bread Co., Cambridge, **MA** ...

5. Locations | CHA Somerville Hospital
www.challiance.org/location/**somerville**-hospital
CHA **Somerville** Hospital is one of three CHA hospital locations north of Boston.Located on Highland Avenue in **Somerville, MA**, just minutes from Tufts University and Davis **Square, Somerville** Hospital is a teaching site for Harvard Medical School.

1. Night Market at Union Square | Somerville Hub
somervillehub.org/events/night-market-**union-square**
Somerville Flea and **Somerville** Arts Council present a flea and artisan market with goods from local ... **High** School Age. School Options ... Night Market at **Union Square**

2. Developer - The Flatiron at Union Square
www.theflatiron70.com/developer.html
Union Square The Players King Ranch Development ... 2-, and 3-family buildings in **Somerville** and Cambridge. His projects gradually grew in scale and complexity ...

1. Union Square Somerville Food Tour - Off The Beaten Path
www.offthebeatenpathfoodtours.com/**union-square**...
Delight in the best of **Union Square**, one of the most popular neighborhoods in Boston. About Join us for a fun foodie adventure through **Union Square, Somerville** - a neighborhood like Brooklyn, NY that is bursting with culture, historical significance, and an exploding food scene!

2. Arts & Entertainment — Union Square Main Streets
www.**unionsquare**main.org/arts-entertainment
There's always something fun to see or do in **Union Square**. Check the listings below to find the best in arts, creative works, music, entertainment, and more. **Union Square** Main Streets

3. Somerville Town Page - Fine Lexington Homes sells Luxury, New ...
www.finelexingtonhomes.com/**somerville**-town-page
Belmont **MA** Town Page. **Somerville, MA** Location, Location, Location!

1. Fluff Fest | Somerville Hub
somervillehub.org/events/fluff-fest
Produced by **Union Square** Main streets, "What the Fluff" celebrates the genius of Archibald Query who invented Fluff here in **Union** Sq. in 1917. This annual event calls upon artists, musical and theatrical performers, inventors, humorists and the general public to celebrate the great American creation.

2. Boston, Somerville prime for Amazon final push – Boston Herald
www.bostonherald.com/2018/01/19/boston...
(**Somerville, MA**, 01/18/18) View of Boston's Back Bay neighborhood from **Union Square** in **Somerville** on Thursday, January 18, 2018. Staff photo by Christopher Evans January 18, 2018-Boston, **MA**.

3. Somerville, MA - Somerville, Massachusetts Map & Directions ...
www.mapquest.com/us/massachusetts/**somerville-ma**...

"What The Fluff?" Festival [09/23/17]
www.thebostoncalendar.com/events/what-the-fluff...
This year's festival, "Fluff Centennial: Inspiring the Next Century of **Union Square** Invention" will take place on Saturday, September 23rd from 3-7 PM (rain date, 9/24) in **Somerville's Union Square**.
This is a special year for the Festival, as it celebrates the 100th anniversary of the invention of Fluff in **Somerville's Union Square**.

- ArtsUnion Walking Tour of Union Square, Fall 2012 "Historic ...

somervilleartscouncil.org/sacfiles/imce/editor/arts**union**...
the future Town during the 1830s, and the almost immediate **rise** of industries along their ... Close by to City Hall sits **Somerville High** School ... 2012 **Union Square** ...

TRAFFIC IMPACT AND ACCESS STUDY - Somerville
www.**somerville**ma.gov/sites/default/files...
Boynton Yards Somerville, Massachusetts ... has prepared a detailed Traffic Impact and Access Study for the proposed **Boynton** ... a "**High-Rise** District", which ...

2. Stormwater Management Report - Somerville
www.**somerville**ma.gov/sites/default/files...
Boynton Yards: Buildings 1 & 2 Stormwater Management Report **Somerville, MA** February 2018 Page 4 of 8 Proposed Conditions In the proposed condition, previously untreated runoff from the Property will be directed to new control

3. Boynton Yards – Building 2 – (2 Earle Street)
s3.amazonaws.com/ifa.**somerville**ma.gov/documents...
Boynton Yards – Building 2 – (2 Earle Street) **Somerville, Massachusetts** . PREPARED FOR DLJ Real Estate Capital Partners, LLC 1123 Broadway, Suite 201 New York, NY 10010 Contact: John Fenton John.Fenton@dljrecp.com (212) 901-4943 PREPARED BY 101 Walnut Street PO Box 9151 Watertown, **MA** 02471 617.924.1770 April 2018 Revised December 2018

4. RAILROAD.NET • View topic - Boston Yards
railroad.net/forums/viewtopic.php?t=70808
Boston **Yards**. ... **YARD**-8 9 & 10 made up the Hump **Yards** at Mystic Jct. **Somerville YARD**-14 East Cambridge was Fitchburg Division freight ... AKA **Boynton** St. **Yard**, on ...

5. Firms pitch plans to develop Somerville's Union Square - News ...
somerville.wickedlocal.com/article/20140313/NEWS/...
The most specific proposal, in fact, was a retread of an idea in a previous square -- RedGate's Kyle Warwick repeatedly suggested a building a 120-room hotel, which his firm had last year proposed for Davis Square, at the corner of Prospect and **Somerville** avenues.

6. RAILROAD.NET • View topic - Yards located in the Greater ...
www.railroad.net/forums/viewtopic.php?t=70521
Yard 9 was on the opposite side of the New Hampshire Route **High** Line (Lowell commuter line) from **Yard** 8, the Hump **Yard**. **Yard** 9 was sold about 1966 for industrial development and to access the area where it was located turn off Washington St. **Somerville** at the Holiday Inn and head straight in to the Boston Engine Terminal (Inner Belt Road?).

- RAILROAD.NET • View topic - Yards located in the Greater ...

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Yard 9 was on the opposite side of the New Hampshire Route **High** Line (Lowell commuter line) from **Yard** 8, the Hump **Yard**. **Yard** 9 was sold about 1966 for industrial development and to access the area where it was located turn off Washington St. **Somerville** at the Holiday Inn and head straight in to the Boston Engine Terminal (Inner Belt Road?).

- Frequently Asked Questions, Union Square Public Benefits ...

smartgrowthamerica.org/program/locus/attainable...
After the adoption of SomerVision, the City launched a neighborhood planning process in Union Square ("**Somerville** by Design"). The neighborhood plan creates a vision not just for the seven D- Blocks, but for all of Union Square and **Boynton Yards**—collectively, approximately 429-acres.

- LEED v4 for Core and Shell Development Project Scorecard

s3.amazonaws.com/ifa.**somervlll**ema.gov/documents...
Project Name: **Boynton Yards** TWO EARLE Address: 153 South Street **Somerville**, **MA** 02143 Date of Issue: 12.3.18 D/C Yes Maybe No 1 0 0 Integrative Process 1 D 1 0 0 Credit 1 Integrative Process 1 Yes Maybe No 12 3 5 Location and Transportation 20 D 0 0 N Credit 1 LEED for Neighborhood Development Location 20 D 2 0 0 Credit 2 Sensitive Land Protection 2

1. Somerville rezoning plan will make Union Square the city's ...

   archpaper.com/.../**somerville**-rezoning-**massachusetts**
   $1 billion redevelopment plan could remake the downtown of **Somerville**, **Massachusetts**. By Jason Sayer ... At community meetings there were lots of drawings of **high** buildings, ...

Somerville rezoning plan will make Union Square the city's ...
archpaper.com/.../**somerville**-rezoning-**massachusetts**
$1 billion redevelopment plan could remake the downtown of **Somerville**, **Massachusetts**. By Jason Sayer ... At community meetings there were lots of drawings of **high** buildings, ...

History of the B&M Railroad — Boston & Maine Railroad ...

www.bmrrhs.org/history-of-the-b-and-m-railroad
The Boston & Maine Railroad Historical Society is composed of people who share a common interest in the history and operations of the Boston and Maine Railroad and other related railroads.

- Full text of "Annual report of the city of Somerville"

archive.org/stream/annualreportofci1922some/...
Full text of "Annual report of the city of **Somerville**" See other formats ...

Proposed Ordinance - 3pb8cv933tuz26rfz3u13x17-wpengine.netdna ...

3pb8cv933tuz26rfz3u13x17-wpengine.netdna-ssl.com/wp...
improved, including identification of ways in which the proposed permitting process aligns the entitlement and approval process with development phasing and construction timing. The City of **Somerville**, **Massachusetts** is located in the Boston Metropolitan area north of the City of Cambridge and west of the Boston neighborhood of Charlestown.

- Proposed Ordinance - 3pb8cv933tuz26rfz3u13x17-wpengine.netdna ...

3pb8cv933tuz26rfz3u13x17-wpengine.netdna-ssl.com/wp...
improved, including identification of ways in which the proposed permitting process aligns the entitlement and approval process with development phasing and construction timing. The City of **Somerville**, **Massachusetts** is located in the Boston Metropolitan area north of the City of Cambridge and west of the Boston neighborhood of Charlestown.

- **Top 10 Boston Completions of 2017 - Multi-Housing News**

www.multihousingnews.com/post/top-10-boston...
Top 10 Boston Completions of 2017. ... Located just west of Arsenal **Yards** at 204 Arsenal St. in Watertown, Mass., the luxury community boasts 297 units. ... the 22-story **high-rise** sits within ...

- **Executive Office of Housing and Economic Development | Mass.gov**

www.mass.gov/orgs/executive-office-of-housing...
The Executive Office of Housing and Economic Development promotes ... than $52 Million to **high** schools and colleges in the Commonwealth ... sewer issues in **Boynton** ...

- **12 Boston developments set to transform the city**

boston.curbed.com/maps/boston-developments-new-2017
Share 12 Boston developments set to transform the city. ... one of which is set to **rise** as **high** as 22 stories, will replace lower-slung fare such as auto shops and laundries. ... Boston, **MA** 02210.

- **Britain announces ban on high-rise combustible cladding | Reuters**

www.reuters.com/.../us-britain-fire-idUSKCN1**MA**0OM
Britain announces ban on **high-rise** combustible cladding. ... (19.69 **yards**)tall. The government had previously indicated it wanted to implement a ban following the Grenfell Tower fire, Britain's ...

February 14, 2019 and February 25, 2019 Letters (Similar letters)

SCC1.1 **For instance, riders on the GLX extension will be 'unloaded' onto a back lot with a vision of a three or more storey above ground parking garage like so many ugly industrial lots around the city. These 'guests' or regular riders then are expected to 'walk around' the buildings up a gradual slope parallel to the very busy and polluted exhaust fumes of Prospect Street.**

Riders on the GLX will arrive on the GLX platform adjacent to a new approximately 2,300 sf green space planned by US2 immediately north of the station area. They will then proceed east along the station walkway and exit the station into a new approximately 20,100 sf civic open space on D2. The civic open space will include new landscape, trees and seating areas. The civic open space area closest to the station is the largest portion of the space and has been designed as an outdoor 'living room' that can provide a place to gather, meet or perform. The 'living room' is located 7 to 15 feet below Prospect Street grade, and as such is separated from vehicles and their pollution on Prospect Street. Station riders will not be required to walk around the buildings – they will have a straight path north to Union Square Plaza which will be visible in the distance once they exit the station. Please see Figure 1-9 for more detail related to access to the station and Section 1.2.4.4 for more information regarding the design of the open space at the station.

SCC1.2 **Rather than have an elevator on each side of Prospect Street on the bridge which would lower the elderly, children and the physically challenged onto an MBTA platform, users are apparently expected to travel down a steep grade to the corner of Prospect and Washington before re-tracing their steps toward the MBTA station itself. This must be in conflict with guidelines for the handicapped which would apply to this situation.**

The planning challenge described relates to access from the Prospect Street bridge to the MBTA station. US2 does not control either the MBTA platform area design or the Prospect Street right-of-way.

US2 agrees that vertical access from the Prospect Street bridge to Union Square Station is important to MBTA patrons accessing Union Square Station from the south. In order to contribute to improving circulation from the station to the Prospect Street bridge, US2 has offered to amend the D2 design to provide, at no cost to the MBTA, easement rights on the D2 property as required to make way for the MBTA elevator and/or to install a stair adjacent to the MBTA elevator location. US2 has also offered to contribute to the cost of the MBTA elevator's installation. US2 will continue to coordinate with the MBTA, the City and other stakeholders on this issue and is hopeful that a solution for the MBTA elevator can be identified.

SCC1.3 **Will there be drop-off and pick-up of passengers on this Prospect St. bridge area and will there be a turning area to accomplish this task? I think that most would agree on the overloading of our streets, bicycle and pedestrian safety and congestion.**

US2 has planned for a drop-off area that includes a designated area for the MBTA's The Ride paratransit program adjacent to Union Square Station on Charlestown Place. Charlestown Place can be accessed from the east via Charlestown Street (existing) or from the north via the Milk Alley (proposed). Providing the drop-off in this location was critical to adhering to the MBTA's requirement that The Ride be located within 100 feet of the station entry. Please refer to Figure 1-8 for D2 site circulation.

The City's current configuration for Prospect Street at the bridge includes a dedicated bus lane, then a bike lane and then a northbound vehicle lane. US2 will ask the City to consider the design of a vehicle drop-off and pick-up at the Prospect Street bridge. Grades, sight distances, mode conflicts and physical constraints will have to be considered and evaluated.

SCC1.4 **Two or three alternate designs for the D2 lot were suggested by experienced and trained designers such as Tim Talun, Prof Anne Tate (whose husband, the Rev. Bob Massie-an Anglican minister in Somerville who recently ran in the primary for governor) and Bill Cavillini as well as Wig Zamore. These thoughtful plans sought to move the station platform further down the line away from the Prospect Street bridge so that the sight lines and access routes would be leveled inviting the newcomer into a vision of Propect Hill and Union Square.**

The design of Union Square Station and the location of the station platform are being designed by the MBTA and GLX project team. As described in Section 1.3, US2 has been coordinating with the MBTA/GLX project team to ensure design integration between the two projects; however, US2 does not have the ability to change the GLX project team's design, particularly since it is so far along in design development and construction planning. US2's proposed D2 design includes a civic open space organized at the GLX/MBTA's planned pedestrian entry to Union Square Station, and the location of this civic open space is consistent with the CDSP approved by the City after an extensive public process that included multiple rounds of neighborhood meetings and public hearings. The access route from the station will be at-grade, include an inviting environment for someone arriving at the station and offer site lines to Union Square and Prospect Hill. Please refer to Section 1.3 for additional information regarding coordination with the GLX, and to Section 1.2.4.4 for additional information regarding the D2 civic open space. See also the response to comment USNC.3, above.

SCC1.5 **If the contaminated brownfields residue known to exist in the D2 area were properly removed and remediated with due consideration for its final disposal, this would also help to assure down to the clay subsoil a proper safe cleansing of this former industrial area.**

Planning and preparation activities for the proposed D2 redevelopment include evaluating remedial alternatives to address residual contamination remaining in site soil and/or groundwater. As part of redevelopment, impacted soils at D2 will be remediated and/or removed from the site or located under protective barriers to limit potential exposures and mitigate risks, which is standard practice and consistent with federal, state and local regulations. Urban fill is ubiquitous across the site, and the City in general, to depths upwards of 15 feet as it was used to fill the Miller's River and is common in this area of Somerville. Urban fill commonly contains contaminants such as metals and PAHs. It will be impractical and possibly infeasible to execute the Project in this manner (i.e., remove fill down to natural soil), nor is it consistent with the standard of care in Massachusetts.

SCC1.6 **One wonders also how the present D2 designs conform to the city's long-term designs such as Somervision. According to this projection, the city is aiming for 125 acres of open space in one of the nation's most congested living areas and yet little regard or accommodation is made for such public accessible areas on this redevelopment lot.**

SomerVision is a comprehensive, City-wide planning document. To assign its targets to the neighborhood scale, the Union Square Neighborhood Plan was developed over an 18-month community process and was adopted by the Planning Board. US2's redevelopment plan area represents a portion of the 'Union Square' area described in these planning documents and not the totality of future open space. The Neighborhood Plan is clear in this distinction and estimates that the 'D Parcels' (the applicant's 'D Blocks') would contribute approximately two acres of new public spaces as they redevelop over time.' (Union Square Neighborhood Plan, page 47).

US2's CDSP application, in committing to approximately 2.5 acres of high-quality civic open space, 25% more than the Neighborhood Plan suggested, was found to be consistent with *SomerVision* and was approved by the Planning Board.

SCC1.7 **Sustainability and run-off water drainage issues remain an issue especially in the Union Square area which has been known to be the site of extensive flooding in the past although recent infrastructure improvements have, hopefully, remediated the problem. Green grass and parks can help to offset water runoff issues.**

Chapter 9 of the DEIR provided information about existing and proposed storm drain infrastructure, as well as stormwater management. Lastly, Section 1.2.2, page 1-24 of the DEIR, Streetscape and Infrastructure Improvements, included additional details about the City's expansion of neighborhood stormwater infrastructure and the Project's contributions to that effort.

Stormwater management facilities will be implemented on a Lot-by-Lot basis and will conform to all Stormwater Management Standards within the Massachusetts Stormwater Handbook to the maximum extent practicable. These on-site mitigation measures will decrease the peak rate of runoff for all storm events up to and including the 100-year storm event. By doing so, these on-site measures will provide relief to the existing (and proposed) City infrastructure that currently experiences surcharge and flooding during large scale storm events.

The Project will include a number of additional low impact development (LID) measures, where feasible and practicable. Residential buildings are anticipated to incorporate both blue and green roof technology to temporarily store stormwater, combined with rain water harvesting for irrigation. Permeable pavement will be substituted for traditional asphalt pavement in areas to promote infiltration and groundwater recharge. Additionally, rain gardens will be constructed in pervious areas to promote water quality treatment and groundwater recharge.

SCC1.8 **Another major concern which has been expressed by several individuals refers to the proposed 'access road' which will run parallel to the Allen Street residents. Apparently. day and night, delivery trucks will drop off and pick up materials related to operations on the D2 lot. Little consideration or consultation has been down with the long-term occupants or the rental and privately-owned properties which are sandwiched between D2 and Target Department story areas.**

The thoroughfare (or access road) planned along the eastern boundary of D2 is one of three permitted through-block connections within the Project area, and the location of this roadway was approved as part of the CDSP process as referenced above, following a public review and planning process required by zoning. The concept of the through-block connections was an outcome of the 18-month Neighborhood Planning process. In general, the thoroughfares are intended to serve two main purposes: (1) to breakdown the scale of the larger blocks in order to improve overall neighborhood circulation and (2) to reduce the number of service and access curb cuts on the pedestrian streets to favor pedestrian mobility.

This access road will primarily serve vehicles, bicycles and trucks and is intended to serve as a point of service access to D2 but also as a future point of service access at the rear of the lots along Allen Street. This will ultimately serve to make Allen Street more pedestrian

friendly, if and when, the properties along Allen Street are improved because their services can load from the rear of the lots. This was a specific goal of the City planning staff and rear/alley loading is common in many urban environments.

Throughout the course of the D2 DSPR process, US2 has also made several design changes in response to comments relative to the Project's interaction with the neighborhood to the east. The D2 plan includes the following:

- US2 is proposing to clean-up a contaminated lot (D2) that operated for decades as a scrap metal yard that included significant truck traffic and noise directly visible and adjacent to the Allen Street properties.
- The building is setback approximately 25 feet from the east property line resulting in an average setback from the existing structures that face Allen Street of approximately 95 feet.
- A setback was added for a portion of the levels above the third floor to further reduce scale.
- The east façade treatment included more segmentation to further breakdown the scale of the façade.
- A landscape planting buffer was added along the southern length of the garage.
- A sidewalk was added adjacent to the alley.

In addition, US2 has collaborated with a group of community members, land owners (including Somerville Community Corporation) and the City ("Milk Square Stakeholders") who are doing some planning for potential future growth in the neighborhood east of D2. As part of their planning, the Milk Square Stakeholders have envisioned how Charlestown Street might be relocated to the north to facilitate better east-west connectivity to the east in the future. US2 revised the location of Charlestown Place on the D2 plan to move it further north in order to better facilitate this future condition.

SCC1.9 **One would hope that such concerns, such as LEEDS compliance, energy efficiency, fire-safe cladding and down drafts surrounding high rises would also be taken into consideration.**

US2 has continued to evaluate measures to make the buildings energy efficient as further described in Chapter 3. In addition, all buildings greater than 50,000 sf will be design to be LEED Gold certifiable and the balance will be LEED Silver certifiable. The safety of the buildings will be part of the building permit review and wind studies will be completed as part of the DSPR for the high rise buildings.

Somerville Catholic Collaborative
Patronage of St. Joseph (1869)
St. Catherine of Genoa Church & School
St. Ann's Parish

March 1, 2019

Secretary Matthew A. Beaton
Exec. Office of Energy & Environmental Affairs
Attn: Alex Strysky
100 Cambridge Street, Suite 900
Boston, MA. 02114

RE: Union Square Redevelopment Project (EEA# 15889) Draft Environmental Impact Report (DEIR)

Dear Secretary Beaton:

I would like to add to my recent comments regarding development by USQ on the D2 lot in Somerville's Union Square on the corner of Prospect Street and Somerville Ave. that there should be serious consideration given to the climate change impact on construction such as the issues outlined in Kate Sheridan's **Boston Globe** recent article which is partially quoted below: SCC2.1

Preparing for the worst: From Cambridge to California, rising seas, storms, fires, and floods threaten the big pharmaceutical makers' labs, inventories, and production lines
Sheridan, Kate. **Boston Globe; Boston, Mass.** [Boston, Mass]25 Feb 2019: D.1.

"....In Cambridge's Kendall Square, one real estate developer has already worked to ensure that a third of the facilities it manages there are prepared for extreme weather events through 2050 or longer.
Those preparations are necessary in part because of where Kendall Square sits. A short walk from the Charles River, the biotech hub already faces a small flood risk from major storms. According to a recent city report, new issues may start to crop up soon. By 2050, the water around Boston should be a foot or two higher than it was in 2000 — so high that the city's report on climate change vulnerability says the dams that separate the rivers around the city from Massachusetts Bay would be pretty useless.
If a once-in-a-decade storm hits, winds might blow the water up from the river — a storm surge — or water might come back up from drainage pipes.
Alexandria Real Estate has over 4.3 million square feet of office space in Kendall Square. That includes at least 1.9 million square feet of brand-new space built with climate change in mind.
Gone are basement electrical rooms and data centers — they've been moved up to the first floor. Thresholds for first-floor doors, too, are all above the point to which the city's reports suggest water might rise if a major storm hits after the sea levels around the city have risen by a foot or two. Yet the real estate company's not-inconsiderable power mostly stops at the thresholds of their own buildings. The company can't stop a street from flooding or make sure the city's drains won't be overwhelmed by stormwater. Developers in Kendall Square have tried; among other things, Alexandria and others have paid for a new stormwater drain that can hold up to 630,000 gallons.
One thing that Alexandria and others can do — and have done — is ensure that their buildings won't make flooding worse. Some Alexandria-owned buildings have equipment on the roofs that can store stormwater for a while before it's released, slowly,— to the street; each site also has a system in place to encourage rain to drain into the ground first, not into the streets. And specialized valves prevent sewer backups from bringing that water into a building. (Even the toilets will still work without adding to the sewer's problems, at least for a day.)
"We're confident that our tenants and our properties here in Kendall Square are well-protected from climate change vulnerabilities like flooding," Andrews said.

There are less tangible risks to consider, too: the prospect that if a company's approach to climate change is too timid, it could be harder to recruit talented employees in an industry where sterling job applicants often have the upper hand.
"As a science-based company focused on improving the quality of life, stakeholders may set expectations related to Biogen's efforts towards climate change," the Cambridge company stated — adding that if it fails to meet those expectations, potential employees may go elsewhere. "Loss of highly-qualified employees to competitors due to falling short of expectations could place Biogen's research and development efforts at risk."
Kate Sheridan cn be reached at kate.sheridan@statnews.com.
Copyright Boston Globe Media Partners, LLC Feb 25, 2019

Clearly, this is just one of several issues which should be examined and acted upon given the long-term vision of transforming the Cambridge/Somerville neighborhood in the months to come. Thank you again for your kind consideration.

Sincerely,

Fr. Richard G. Curran, Ed.D.

Patronage of St. Joseph
264 Washington Street – Union Square
Somerville, MA. 02143-3313

Tel: (617)-666-4140 or 2087
Cell: (774)-269-2256
e-mail: frcurran@hotmail.com

March 1, 2019 Letter

SCC2.1 Climate change impact

The Project is taking a pro-active approach to climate change issues as identified in the City's Climate Change Vulnerability Assessment (CCVA). US2's climate change resiliency strategy includes increasing tree and vegetative cover; installing green roofs; installing cool roofs; setting finished floor elevations above projected flood elevations; providing stormwater management infrastructure and detention; and contributing the City's Somerville Avenue Streetscape and Utility Improvements that will add significant capacity to the neighborhood stormwater management system. Please refer to Chapter 6 of the DEIR for additional information regarding climate change resilience and adaptation.

Somerville Bicycle Advisory Committee

To: Alexander Strysky
CC:
Mayor Joe Curtatone
Somerville Director of Transportation Brad Rawson

Subject: EEA# 15889
Somerville Bicycle Advisory Committee advocates to make biking in Somerville safer and more accessible to people of all ages and abilities. We write to express general support for the Union Square Redevelopment Draft Environmental Impact Report, but also ask that the project allocate right-of-way for a protected intersection at Somerville Ave and Prospect St. SBAC.1

We support walkable, bikeable, transit-oriented development, and we note that the project already includes a number of positive improvements for bicycle transportation:

- financial contribution towards the Somerville Avenue Improvements Project, which includes protected bike lanes
- implementing at least two Bluebikes bike share stations
- 1,750 bicycle parking spaces throughout Union Square, including 560 bicycle parking spaces on the D2 block and 90 secure and covered bicycle parking spaces for MBTA riders
- goal of 60 percent walk/bike/transit modeshare (we would prefer to set this goal higher, which we believe is highly achievable with the right infrastructure improvements)

However, we would like to see a clearer commitment to building safe bicycle routes throughout the project area. In particular, we believe the redevelopment of the D2 block should give the City adequate space for a protected intersection at the heart of Union Square. SBAC.2

Somerville's Union Square Neighborhood Plan calls for protected bike lanes along Somerville Ave, Prospect St, Washington St, and other streets. Following MassDOT's Separated Bike Lane Planning & Design Guide, the intersections should include protected intersections. However, since protected intersections require width for protected bike lanes and corner refuge islands in addition to general travel lanes it may be difficult to build a protected intersection within the existing right-of-way. Since the D2 block is currently largely vacant, this development is the perfect opportunity to allocate enough space to a protected intersection. Given the constrained right of way, if the development does not ensure space for a protected intersection, it may be difficult to ever achieve the City's and the proponent's goals for bike mobility in Union Square.

Thank you,

Tom Lamar
66 Adams St, Somerville
Vice Chair, Somerville Bicycle Advisory Committee

SBAC.1 **Ask that the project allocate right-of-way for a protected intersection at Somerville Ave and Prospect St.**

Primary neighborhood bicycle routes are being planned and implemented by the City as part of the overall streetscape and infrastructure program for the neighborhood. If the City would like to explore providing protected intersections at the Prospect Street and Somerville Avenue intersections (i.e., at D1.1, D2.1 and D6.1), US2 is willing to collaborate to investigate feasibility. The planning for D2.1 at the southeast corner of the intersection is further advanced in design, therefore this location is less flexible. Since this is a significant corner in the neighborhood (as a connecting intersection between the Union Square Plaza and the path to Union Square Station), US2 has proposed a wider than required sidewalk. If the City wants to design and propose a revised configuration of that corner that works better for cyclists and pedestrians, US2 would be happy to discuss the concept.

SBAC.2 **Would like to see a clearer commitment to building safe bicycle routes throughout the project area. In particular, we believe the redevelopment of the D2 block should give the City adequate space for a protected intersection at the heart of Union Square.**

Primary neighborhood bicycle routes are being planned and implemented by the City as part of the overall streetscape and infrastructure program for the neighborhood. The Somerville Avenue Streetscape and Utility project plans include protected bike lanes on both sides of Somerville Avenue including across frontages of D1, D2 and D6. It is anticipated that additional or improved bicycle routes will be provided through the Project area as the vision from the Neighborhood Plan is implemented on the other neighborhood streets and intersections. US2 is making contributions totaling $4.6 million toward this infrastructure program and the property taxes generated from the Project will further fund the debt service for the infrastructure program.

From: pennie taylor
To: Strysky, Alexander (EEA)
Subject: Comments on DEIR for EEA #15889 Union Square Redevelopment
Date: Friday, March 01, 2019 11:56:05 AM

Dear Secretary Beaton, attn. MEPA Office, Mr. Strysky,

Thank you for the opportunity to comment and thanks also for extending the comment period to allow for thorough review of the DEIR. Upon review, the DEIR is an inadequate response to the myriad environmental issues this development raises. I'm a member of the Union Square Neighborhood Council board so many points are expanded in the letter we sent. I want to emphasize a few points and add some observations as an individual:

Re: alternative designs and parking spaces:
If this is the "transit-based development" the City and developers claim, cars must be discouraged, and allowing for them must take a bottom rung. No one should be accommodated for having a car in proximity to robust public transportation in 2019, it is wildly irresponsible. Right now the area is fully serviced by buses so the idea that we need more parking while we're expanding public transit is galling. The developer provided required "Reduced Build" alternatives that decrease the amount of housing alone. However, the developer failed to explore other more creative ways of reducing density, for example, by choosing to locate some of the parking garages underground, as is done regularly in these types of developments. Moving at least some parking underground in this development would free up land for green and open space and effectively reduce density without sacrificing housing and commercial development. The long-term social and environmental benefits of such choices would greatly outweigh the upfront costs. PT.1

Re: Flooding
There are many interventions that can and must happen before stormwater storage becomes an issue. Adding any impermeable surfaces to this site, in 2019, in a flood plain, is unacceptable. This seems obvious. The only acceptable plan is full permeability; building in bioswales and other plant-based methods for processing water. Storage is a last resort and frankly an embarrassing solution for a City that claims to be focused on its sustainable future.The City's plan for expansion of neighborhood stormwater infrastructure has met with immediate neighborhood condemnation, is an antiquated plan that doesn't incorporate 2019-level technology, and ignores the importance of city-wide efforts to increase permeability and options like bioswales, and enforcing permeability and water runoff rules on property owners, to reduce the amount of water going into the stormwater system in the first place. I helped found "Friends of Nunziato Park," a group alarmed at the City's short-sighted plan of placing an underground storage tank for stormwater right by Union Square. Pressure from developers is pushing this weak plan forward, which is dangerous to us all. Such systems are a fairly short-term solution (i.e. the tank fills up...) and should only be a last resort if all other contemporary (read: not a concrete storage tank) methods are not implemented. PT.2

Re: Climate Change resilience
Unlike myself and my neighbors, the developers do not live in our neighborhood. Perhaps they missed the memo that the City is committed to sustainability. I am alarmed that the Proponent does not commit to renewable energy generation on site, citing current costs being prohibitive for solar and wind power development. Their indication that they will consider renewable energy later on in the project is very vague. Consideration is far from a commitment. They do not commit to any minimal percentage of renewable energy purchase, even though there are many available, cost-effective renewable energy sources already on-line that have been championed by the City of Somerville and the State of Massachusetts Executive Office of Energy and Environmental Affairs (EEA). The Proponent only commits to "exploring viability" for many measures proposed by several agencies to minimize energy use in the built environment. *There is no way to hold someone accountable for "exploring."* The developer plans to certify 11 of the 17 buildings as LEED v4 BD+C Gold or Silver; however, these standards are already becoming out of date, and there are better techniques to achieve the goals of climate mitigation, adaptation, and well-being of occupants such as Passive house (PH). I'm also left wondering... why not all the buildings? We're not retrofitting. We're building new. So build them all as sustainably as possible. The Proponent has stated the calculated payback period for PH is too long (24 PT.3 PT.4

years). However, this number is from a NYSERDA study for a tall building project and doesn't factor in the incentives provided by the state of Massachusetts outlined in the MassDOER comments. Furthermore, this study praises the benefits of PH design- contrary to the indications by the developer. Additionally, the Proponent claims that no local examples under similar regulations to their planned Development exist for true cost comparisons. However, Distillery North in South Boston and Concord Highlands in Cambridge (under development) represent two examples of multi-family residences built to PH standards.

Many excellent suggestions from the Union Square Neighborhood Council, the broader community, and other State agencies in response to the Phase I Waiver request have been largely ignored. I respectfully demand the Proponent address such requests in detail with proper data and analysis before the State accepts a FEIR.

With gratitude for your thoughtful consideration on these issues, for the health and future of the residents of Union Square,
Pennie Taylor
8 Quincy St. #2 Somerville

PT.1 **If this is the "transit-based development" the City and developers claim, cars must be discouraged, and allowing for them must take a bottom rung. No one should be accommodated for having a car in proximity to robust public transportation in 2019, it is wildly irresponsible. Right now the area is fully serviced by buses so the idea that we need more parking while we're expanding public transit is galling. The developer provided required "Reduced Build" alternatives that decrease the amount of housing alone. However, the developer failed to explore other more creative ways of reducing density, for example, by choosing to locate some of the parking garages underground, as is done regularly in these types of developments. Moving at least some parking underground in this development would free up land for green and open space and effectively reduce density without sacrificing housing and commercial development.**

The approved Union Square Zoning Overlay District includes a carefully considered parking policy that requires a shared parking strategy, permits a maximum of 1,500 total parking spaces, and has no required parking minimum ratios. The proposed Project and its transportation demand management approach is responsive to this policy and includes 1,495 proposed parking spaces. The proposed parking levels are based on developing a mix of Project uses, operating shared parking facilities and the parking management strategy outlined in the DEIR. Please see Section 4.5.6 of the DEIR for more information regarding the parking plan and Section 2.3 of the FEIR for more information regarding the shared parking model.

In an effort to encourage a higher rate of shared vehicle use as requested by the commenter, the Project will provide approximately 14 of parking spaces dedicated to car sharing, and US2 has agreed to provide additional incentives for car sharing services for every residential unit.

As part of preparing the additional alternatives presented in the DEIR, US2 considered the goals of the overall Project, the requirements of the Union Square Zoning and the feasibility of the alternative development scenarios. Throughout the Project planning process, a primary objective for Union Square's revitalization was to create commercial spaces, jobs and commercial taxes. In furtherance of this goal, the ratio of commercial to residential mix for the overall development was heavily discussed during the Board of Alderman's approval of the Union Square Zoning. Ultimately, the City's Union Square Zoning set a requirement that 60% of the Project must be commercial development. As such, US2 did not consider reduced density alternatives that decreased the amount of commercial space, and instead focused on reduced residential space to realize the requested "reduced build" scenario.

While moving more parking underground may reduce density as to the portion of improvements that are above ground, as suggested in the comment, and reduction of density can indirectly lead to certain environmental benefits (although it can also lead to

reductions in benefits), it does not result in a reduction in the density of the occupied uses that generate environmental impacts generally speaking. In addition, while the Preferred Alternative includes above-grade parking in some locations, the Preferred Alternative also includes the provision of below-grade parking on portions of D1, D3 and D6, where below-grade parking appears feasible. The feasibility of underground parking is very much site dependent and is not universally included in new developments in the metro area, particularly in suburban locations and in locations subject to flooding. Feasibility depends on the construction cost, site risks and the market conditions, among other factors will be further evaluated as individual Lots are developed. The construction costs include the premium costs associated with underground construction (e.g., excavation, shoring, dewatering, environmental remediation, etc.) as well as the cost of other benefits provided by the Project. The market conditions include the rents that can be achieved for uses in this location. Underground parking on D2 was evaluated and determined to be infeasible. Given these considerations, the "reduced build alternative" did not include any additional below-grade parking.

PT.2 **The only acceptable plan is full permeability; building in bioswales and other plant-based methods for processing water.**

Full permeability is not feasible across the Project site. Stormwater management facilities will be implemented on a Lot-by-Lot basis and will conform to all Stormwater Management Standards within the Massachusetts Stormwater Handbook to the maximum extent practicable. These on-site mitigation measures will decrease the peak rate of runoff for all storms up to and including the 100-year storm event. By doing so, these on-site measures will provide relief to the existing (and proposed) City infrastructure that currently experiences surcharge and flooding during large scale storm events.

The Project will include a number of additional LID measures, where feasible and practicable. Building designs will consider both blue and green roof technology to temporarily store stormwater, combined with rain water harvesting for irrigation. For example, the D2.1 building is planned to incorporate a blue roof. Permeable pavement installed in portions of the Block's hardscape areas where appropriate and feasible to promote infiltration and groundwater recharge. Additionally, rain gardens will be constructed in select areas and where feasible to promote water quality treatment and groundwater recharge.

PT.3 **Commitment to renewable energy.**

US2 worked with Solect Energy to study the solar potential of the Project and to advise the developer of solar opportunities and considerations early in the planning process. Solect Energy is a top 10 solar provider in the United States and has installed over 90 megawatts of PV systems in 400 projects throughout the New England market. US2, in conjunction with Solect Energy, has identified solar-ready zones on many of the Project's

rooftops, where it makes the most sense to locate future photovoltaic installations. After allowing space for conduit, access and setbacks, the resulting available area for solar PV set-aside was approximately 92,000 sf. In order to determine the roof area that could be committed to solar PV set-aside at this time, the commercial buildings that could be lab/office needed to be identified and excluded from the set-aside area. Lab/office buildings have significant rooftop HVAC requirements that take up a majority of the available rooftop area and leave little area for a solar PV installation. Lots D1.2, D3.1 and D3.3 are all identified as potential lab/office buildings and as such, a commitment to a PV solar set-aside on these rooftops cannot be made until the final use is determined. The resultant solar PV set-aside area after excluding Lots D1.2, D3.1 and D3.3 is approximately 40,000 sf. Please refer to Section 3.7 for additional information.

PT.4 Passive House.

US2 has committed to building D4.3 as a Passive House project. This demonstration project will contribute to Somerville's sustainability goals and help establish a Passive House market in Massachusetts. This FEIR contains a thorough Passive House analysis of the multi-family residential buildings. It outlines the benefits and challenges associated with implementing Passive House. US2 will continue to leverage the D4.3 experience and these studies to further evaluate other residential projects for Passive House as they are developed. Passive House will be considered for all residential buildings built in Phases 2, 3-South and 3-North. Passive House principles are proposed in current designs across Union Square. Please refer to Section 3.4 and Appendix E for details.

March 1st, 2019
Secretary Matthew Beaton
Executive Office of Energy and Environmental Affairs
Attn: Alex Strysky
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Secretary Beaton,

As members of Union United and proud residents of Union Square, we write you to voice our concern with the inadequacy of US2's Union Square Redevelopment DEIR – EEA No. 15889. The developer has failed to put forth a comprehensive, good-faith plan that is conscious of the health and environmental wellbeing of our community, and we request that you require them to follow through on that duty and file supplementary material for the DEIR.

The developer's vision for transit in Union Square is woefully myopic, and, in a time of rapid climate change during which Somerville aims for carbon neutrality, recklessly auto-centric. US2 claims that they'll build transit-oriented development, and yet by adding 1,495 new parking spaces to the area, they would in reality disincentivize new residents from using the long-awaited Green Line Extension spur and encourage them to clog our streets and neighborhoods with throngs of traffic. The emissions of such traffic have been shown to increase mortality, and yet US2 has not responded to requests to redesign public space in the D2 lot to decrease park-goers' UU.1
exposure to exhaust. The added traffic will also choke bus routes 85, 86, 87, and 91, further UU.2
disincentivizing the use of public transit. To top it off, US2 has not planned to reduce the size or build underground the massive and imposing parking garage that will loom over residences on UU.3
Allen Street, and as such it will block the neighborhood off from access to the new T stop. Supplemental reports from US2 should respond to these transit concerns by aiming for 40% mass transit modality instead of a tepid 22%, scaling parking down to a 0.48 parking space/square foot UU.4
ratio by burying most of the parking garage, and investing in more bike and bus infrastructure.

We are also concerned that US2 has failed to fully account for their impact on flooding in UU.5
Union Square. Based on the scale of development planned for the D2 parcel, the amount of wastewater channeled into Somerville's already over-burdened sewer system will swell significantly, and the increased runoff from the construction of more impervious ground cover will only stress the system further. Already, basements in Union Square regularly flood when these drainage networks overflow. US2 must submit supplementary studies to reduce their impact on those networks by incorporating plans for better water management systems, more greenspace to absorb runoff, and contributing to the maintenance of a particularly problematic clogged drainage pipe owned by the MBTA.

Furthermore, in response to legal requirements and community pressure to consider alternative plans to reduce the density of its development, US2 proposed alternative plans that maintained the size of hotel space, increased the size of laboratory space, and only mitigated density at the expense of what the community needs most: housing. This plan is unacceptable, as it will decrease the environmental efficiency of transit-oriented and walkable urban planning. US2 should submit supplemental alternative plans that reduce the density of parking space

instead of housing, in tandem with improving the energy efficiency of its buildings with the use of passive house design standards.

Union United remains committed to ensuring that development in Union Square benefits all those who live and work here, and so we urge you and the Office of Energy & Environmental Affairs to require the aforementioned supplemental environmental impact analysis from US2 before the project is allowed to move forward. We appreciate your consideration and hope that you stand with the residents and workers of Union Square.

Sincerely,

Union United Coalition's Steering Committee,

Jacinta Arena
Rae Axner
Sandra Brown
Bill Cavellini
Edwidge Hercule
Dirce Silva

337 Somerville Av.
Second Floor
Somerville MA 02145

UU.1 **Redesign of D2 plaza (air quality).**

The proposed location of the D2 plaza was arrived at through a lengthy public review and planning process, including the process that resulted in the approval of the CDSP. This extensive process included multiple rounds of neighborhood and stakeholder meetings, multiple public hearings, review by planning staff and the Planning Board, and approval of the CDSP, which specifies that the plaza on D2 be located along Prospect Street, where it lines up with the long-planned entrance to the future Union Square Station. The approval of the CDSP followed earlier extensive planning efforts that resulted in *SomerVision* and the Neighborhood Plan, again with many public meetings and hearings.

The D2 plaza is part of the initial Project phase, and since the ENF was filed US2 has been refining D2's design through the City's DSPR process. As part of the D2 planning process, notwithstanding the fact that the location of the D2 plaza was previously evaluated and approved as part of the CDSP process, certain community members suggested that the design of the plaza should be significantly revised in light of concerns regarding pollution impacts from vehicles on Prospect Street. More specifically, these members of the community suggested that US2 consider an alternative plan that would require a significant reconfiguration of the D2 design, an amendment to the CDSP, to accommodate a proposal to move the D2 parking structure underground, situate the plaza in the center of the D2 site and locate a building between Prospect Street and the plaza. It was suggested that this reconfigured design would serve to minimize certain vehicular pollution impacts on users of the plaza.

As noted in the DEIR, US2 has studied the community proposed alternative, evaluated 'pros' and 'cons', and estimated the cost of the underground parking solution. One of the 'cons' identified was that the revised plaza location is not centered on the pedestrian access to Union Square Station, and the reconfiguration would require pedestrians accessing the station via the 'at-grade' accessible route to travel further. The reconfigured design would also result in making the plaza area less visible from the street, potentially creating concerns about whether users of the space would perceive it as secluded or unsafe.

To further understand the alternative design proposed by certain members of the community, the City hired a third-party construction estimating consultant to estimate the cost of the alternative and some variants. Ultimately, the premium cost of the alternatives was cost prohibitive. The Project is not able to absorb the additional cost, in addition to all of the other Project benefits outlined herein, and remain financially viable. Project feasibility is further challenged by increased risk, significant schedule delay and design challenges associated with implementation of the alternative plan.

Given the challenges associated with moving the parking underground on D2, and the infeasibility of that approach, which would result in significant delays and substantial costs, US2 revised the civic open space design in other ways to make it more resilient to vehicular pollution impacts. The width of the D2 civic open space has been increased to create greater horizontal separation from the civic open space areas most likely to be populated by pedestrians to Prospect Street vehicles. The elevation of the plaza has also been set at approximately the same elevation as the adjacent Union Square Station, allowing the southern approximately 150 feet of the plaza to benefit from being more than seven vertical feet below Prospect Street. The largest portion of the plaza, where people are most inclined to congregate, is at the southern end of D2 and benefits from the most vertical separation from Prospect Street (approximately 10 to 14 vertical feet). A vegetated landscape buffer has also been planned between the Prospect Street sidewalk and the main pedestrian areas of the plaza to further separate main pedestrian areas on the plaza from vehicles. Additional information regarding the D2 civic open space can be found in Section 1.2.4.4.

UU.2 Added traffic will choke bus routes, further disincentivizing the use of public transit.

US2 understands the concerns raised about traffic congestion potentially inhibiting bus operations. Although US2 does not have the ability to control bus operations, these concerns have been raised with the City and the MBTA. The MBTA is currently undergoing evaluations of bus services throughout its system to identify areas in need of improvement. The bus evaluation in the DEIR provided information to the MBTA regarding bus service through and adjacent to Union Square, and it is anticipated that this information will help inform the MBTA regarding issues of concern in the area, and areas where additional operational efficiencies may be required.

Section 2.5 provides a description of potential interventions to improve MBTA bus service in the study area. The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts. The City has both the ability and the willingness to attempt additional interventions to benefit transit. The City may use the overall transportation mitigation and investment dollars provided per US2's development agreement to implement roadway changes. In addition, through the individual plans for each Lot, US2 will work with the City on potential transit improvements proximate to each Lot. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger operations within Union Square and will be used to help determine future improvements or the success of ones previously implemented.

UU.3 **US2 has not planned to reduce the size or build underground the massive and imposing parking garage that will loom over residences on Allen Street, and as such it will block the neighborhood off from access to the new T stop.**

Throughout the course of the D2 DSPR process, US2 has also made several design changes in response to comments relative to the Project's interaction with the neighborhood to the east. The D2 plan include the following:

- US2 is proposing to clean-up a contaminated lot (D2) that operated for decades as a scrap metal yard that included significant truck traffic and noise directly visible and adjacent to the Allen Street properties.
- The building is setback approximately 25 feet from the east property line resulting in an average setback from the existing structures that face Allen Street of approximately 95 feet.
- The east façade has been reduced in length and the east façade treatment included more segmentation to further breakdown the scale of the façade.
- A setback was added for a portion of the levels above the third floor to further reduce scale.
- A landscape planting buffer was added along the southern length of the garage.
- A sidewalk was added adjacent to the alley.

In addition, US2 has collaborated with a group of community members, land owners (including Somerville Community Corporation) and the City ("Milk Square Stakeholders") who are doing some planning for potential future growth in the neighborhood east of D2. As part of their planning, the Milk Square Stakeholders have envisioned how Charlestown Street might be relocated to the north to facilitate better east-west connectivity to the east in the future. US2 revised the location of Charlestown Place on the D2 plan to move it further north in order to better facilitate this future condition.

UU.4 **Aim for 40% mass transit modality instead of a tepid 22%, scaling parking down to a 0.48 parking space/square foot ratio by burying most of the parking garage, and investing in more bike and bus infrastructure.**

US2 agrees that transit mode share is an important factor in minimizing vehicle use. However, the share of pedestrian and bicycle trips is also an important factor, as not every individual is travelling longer distances that are best done by transit. It is anticipated that pedestrian and bicycle trips will continue to be an important mode of travel in, through and out of Union Square by future residents and workers, and encouraging these modes of travel are important for balancing the impacts on transportation infrastructure.

In addition, the mode share percentages were determined through coordination with the City. The focus of these mode share percentages was to reduce vehicle trips and encourage other modes of travel, whether they be transit, walking or bicycling. The goal of the Project's required monitoring programs that will be implemented for each Lot will be to continue to evaluate these mode share percentages, with the goal of reducing vehicle trips, and appropriately identify potential mitigation and programs that may be needed to further reduce vehicle trips. The City is anticipated to continue to work with the MBTA as the GLX operations mature to identify any improvements to Green Line service and/or bus service to ensure that transit service appropriately meets demand.

The approved Union Square Zoning Overlay District includes a carefully considered parking policy that requires a shared parking strategy, permits a maximum of 1,500 total parking spaces, and has no required parking minimum ratios. The proposed Project and its transportation demand management approach is responsive to this policy and includes approximately 1,495 proposed parking spaces. The proposed parking levels are based on developing a mix of Project uses, operating shared parking facilities and the parking management strategy outlined in the DEIR. Please see Section 4.5.6 of the DEIR for more information regarding the parking plan and Section 2.3 of the FEIR for more information regarding the shared parking model. The DEIR also included an unshared parking analysis that was completed using the ITE Parking Generation manual, 4th edition. A summary of this analysis was included in Appendix B-8 of the DEIR and shows that the potential demand if parking were unshared and not managed as described in the DEIR, could be over 4,800 parking spaces. The parking ratios proposed for the Project are below transportation industry standards.

UU.5 **Failed to fully account for the project's impact on flooding in Union Square. Based on the scale of development planned for the D2 parcel, the amount of wastewater channeled into Somerville's already over-burdened sewer system will swell significantly, and the increased runoff from the construction of more impervious ground cover will only stress the system further. Already, basements in Union Square regularly flood when these drainage networks overflow. US2 must submit supplementary studies to reduce their impact on those networks by incorporating plans for better water management systems, more greenspace to absorb runoff, and contributing to the maintenance of a particularly problematic clogged drainage pipe owned by the MBTA.**

Chapter 9 of the DEIR provided information about existing and proposed storm drain infrastructure, as well as stormwater management. Lastly, Section 1.2.2, page 1-24 of the DEIR, Streetscape and Infrastructure Improvements, included additional details about the City's expansion of neighborhood stormwater infrastructure and the Project's contributions to that effort.

Stormwater management facilities will be implemented on a Lot-by-Lot basis and will conform to all Stormwater Management Standards within the Massachusetts Stormwater Handbook to the maximum extent practicable. These on-site mitigation measures will

decrease the peak rate of runoff for all storm events up to and including the 100-year storm event. By doing so, these on-site measures will provide relief to the existing (and proposed) City infrastructure that currently experiences surcharge and flooding during large scale storm events.

The Project will include a number of additional LID measures, where feasible and practicable. Residential buildings are anticipated to incorporate both blue and green roof technology to temporarily store stormwater, combined with rain water harvesting for irrigation. Permeable pavement will be substituted for traditional asphalt pavement in areas to promote infiltration and groundwater recharge. Additionally, rain gardens will be constructed in pervious areas to promote water quality treatment and groundwater recharge.

Matthew Beaton, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office / MEPA Analyst Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Via email to Mr. Alex Strysky
RE: EEA#15889, ENF, Union Square Redevelopment, Somerville MA

Secretary Beaton,

I am a resident of Union Square and part of the Union Square Neighborhood Council, and a member of Fossil Free Somerville. I appreciate the opportunity to provide comments on the Draft Environmental Impact Report (DEIR) of the Union Square Redevelopment Project (EEA# 15889).

As a resident very concerned about the environment, climate change and sustainability, I find this DEIR lacking in many regards. Overall, it does not indicate a firm commitment to environmental protection and sustainability. The Phase 1 Waiver was submitted in Summer 2018, and the fact that the state and community's suggested changes to that Waiver have not been incorporated suggests the same lack of commitment.

The City of Somerville has pledged to be carbon neutral by 2050. Similarly, under the Global Warming Solutions Act, the state of Massachusetts is pursuing 80% reduction in emissions by 2050. These City and State level goals require the participation of redevelopments of this scale, and thus, the Proponent. My following comments will mainly focus on the Greenhouse Gas Emissions chapter (7), but the weak analysis of environmental impacts pervades the entire Report.

Renewable Energy
The Proponent does not commit to renewable energy generation on site, citing current costs being prohibitive for solar and wind power development. Their indication that they will consider renewable energy later on in the project is at best tepid ("US2 will encourage the continued evaluation of energy efficiency and renewable energy measures throughout the life of the Project." P 7-39) Furthermore, they fail to commit to renewable energy purchase ("US2 will consider the purchase of Green Energy once the buildings come on line based on then- available source options and rates." 7-33), even though there are many available, cost-effective renewable energy sources already on-line that have been championed by the City of Somerville and the State of Massachusetts Executive Office of Energy and Environmental Affairs (EEA). Somerville's Community Choice Aggregation program is an example of a cost-effective renewable energy source that is already in place and available in the City, and has an option for 100% renewable energy purchase. RW.1

Building
The Proponent has agreed to do the bare minimum in terms of sustainable building, nothing more. The LEED v4 BD+C Gold and Silver standards which they have agreed to may well be

outdated before the building is completed. In the Building Energy Modeling (7.2.2), the Proponent only considers three limited energy efficiency alternatives for each of the eight model groups, and only deems VRF heat pumps cost-effective enough to be incorporated into the design for three of the eight groups. The Proponent indicated that they will evaluate other alternatives as the project progresses. This does not inspire confidence. The Proponent should strive for an energy use intensity that is at least twenty-five percent (25%) below ASHRAE 90.1 2010. This aligns with both the City zoning code and the Climate Forward Plan's Priority Action of Adopt Flood and Extreme Heat Resilience Standards for New Construction, (see Performance Metrics, p. 25 of the Climate Forward Plan). RW.2

The Proponent indicated that they have considered building to the Passive House (PH) standard, but claimed infeasibility due to a long payback period of 24 years, which was determined through comparison of a NYSERDA study on tall buildings (FXFOWLE Podium: Feasibility of Implementing Passivhaus Standard for Tall Residential Buildings). This comparison is limited, in that the study only reflects costs for a high-rise, 450 unit building, when other sized buildings should be assessed. The Proponent also claims that no local examples under similar regulations (to the Development) exist, and they cannot fully understand the costs. Distillery North in South Boston and Concord Highlands in Cambridge (under development) represent two examples of multi-family residences built to PH standards. Additionally, several state and federal incentives exist, as illustrated by the comments from DOER. The dismissal of PH is short-sighted and ill-informed, especially in the final paragraph of the section on 7-12, which suggests a tradeoff between affordable units and sustainability. It underscores the lack of commitment to actual greenhouse gas emission reductions. RW.3

Waste Management

In their analysis of Current Design and Mitigation Measures (7.2.1), the Proponent fails to discuss a comprehensive waste management plan, which is imperative for a development of this scale and density. Recycling and construction waste management are mentioned, but no concrete plan is given. With the density and intensity of use of the proposed development, the Proponent should be obliged to estimate the volume of waste, and site disposal facilities and services to ensure adequate public health consideration. Additionally, the Proponent should signify how they will ensure that commercial tenants will comply with the Massachusetts Commercial Organic Waste Ban (310 CMR 19.000). RW.4

Transit

The Greenhouse Gas Emissions chapter does not adequately account for the impact of transit, or suggest design methods to encourage transit, walking and biking. Comparing the thousands of pages of traffic information to the dearth of information on pedestrian, bicycle and transit-oriented development reflect the neglect of an area of important environmental and public health impact. Accessibility of the Green Line station remains an issue as well. Further, number of parking spots should not exceed 1500 (which already indicates a significant impact on GHG emissions from transportation). RW.5 RW.6

Green space

The amount of quality green civic space in the design is much lower than needed to meet Comprehensive and neighborhood planning goals. The community has submitted alternative RW.7

designs that would better meet these goals, but so far they have not been incorporated by the Proponent.

In conclusion, the Proponent has not thoroughly investigated the impact the development will have on the environment, nor will they commit to adequate sustainability measures. This could result in significant public health concerns and contribution to climate change. I would urge the State not to accept an EIR until the Proponent makes real commitments to reducing greenhouse gas emissions and ensuring environmental quality better than its current status, not worse.

Sincerely,

Rachel J. Weil
Union Square Neighborhood Council, Member
Fossil Free Somerville, Member

11H Concord Avenue #1
Somerville, MA 02143

RW.1 **Failure to commit to renewable energy and renewable energy purchase.**

US2 worked with Solect Energy to study the solar potential of the Project and to advise the developer of solar opportunities and considerations early in the planning process. Solect Energy is a top 10 solar provider in the United States and has installed over 90 megawatts of PV systems in 400 projects throughout the New England market. US2, in conjunction with Solect Energy, has identified solar-ready zones on many of the Project's rooftops, where it makes the most sense to locate future photovoltaic installations. After allowing space for conduit, access and setbacks, the resulting available area for solar PV set-aside was approximately 92,000 sf. In order to determine the roof area that could be committed to solar PV set-aside at this time, the commercial buildings that could be lab/office needed to be identified and excluded from the set-aside area. Lab/office buildings have significant rooftop HVAC requirements that take up a majority of the available rooftop area and leave little area for a solar PV installation. Lots D1.2, D3.1 and D3.3 are all identified as potential lab/office buildings and as such, a commitment to a PV solar set-aside on these rooftops cannot be made until the final use is determined. The resultant solar PV set-aside area after excluding Lots D1.2, D3.1 and D3.3 is approximately 40,000 sf. Please refer to Section 3.7 for additional information.

The decision to purchase renewable energy will be made on a case-by-case basis as buildings come on-line, based on then-current GHG reduction targets and financial analyses.

RW.2 **The Proponent should strive for an energy use intensity that is at least twenty-five percent (25%) below ASHRAE 90.1 2010.**

The MEPA analysis uses AHSRAE 2013 as amended by the Massachusetts State Energy Code as its baseline, as required by the GHG Policy. AHSRAE 2013 as amended by the Massachusetts State Energy Code provides a significantly more stringent energy baseline than ASHRAE 2010. The Project's planned energy use intensities range between 15% to 25% below ASHRAE 2013 and the Massachusetts State Energy Code Amendments.

RW.3 **Dismisses Passive House.**

US2 has committed to building D4.3 as a Passive House project. This demonstration project will contribute to Somerville's sustainability goals and help establish a Passive House market in Massachusetts. This FEIR contains a thorough Passive House analysis of the multi-family residential buildings within the Project. It outlines the benefits and challenges associated with implementing Passive House. US2 will continue to leverage the D4.3 experience and these studies to further evaluate other residential Projects for Passive House as they are developed. Passive House will be considered for all residential

buildings built in Phases 2, 3-South and 3-North. Passive House principles are proposed in current designs across Union Square. Please refer to Section 3.4 and Appendix E for details.

RW.4 **Fails to discuss a comprehensive waste management plan. Estimate the volume of waste, and site disposal facilities and services to ensure adequate public health consideration. Additionally, the Proponent should signify how they will ensure that commercial tenants will comply with the Massachusetts Commercial Organic Waste Ban.**

Section 12.8 of the DEIR addressed the Project's approach to construction waste management. Construction demolition and waste management plans will be part of the Construction Management Plan that will be prepared for each building project during the building permit process as described in Chapter 12 of the DEIR. During Project operations, property managers for each building and the tenants for each building use will be responsible for collaborating to develop a waste management plan for each building. The detailed understanding of the specific types of tenants that will occupy each building that is necessary to estimate the volume of waste and develop disposal plans is not available at this stage of the Project. All waste management and waste disposal on the Project will comply with relevant Massachusetts regulations, including the Massachusetts Commercial Organic Waste Ban as applicable.

RW.5 **The Greenhouse Gas Emissions chapter does not adequately account for the impact of transit, or suggest design methods to encourage transit, walking and biking.**

The mobile source component of the GHG Analysis used the transportation data provided in the TIA included in Chapter 4 of the DEIR. The vehicle impact analysis included in the TIA accounts for the aggressive mode share goals of the Project, which accounts for transit access and the Project's Mobility Management Plan, included in Section 4.5.7 of the DEIR, which provides measures to encourage transit, walking and biking.

RW.6 **Number of parking spots should not exceed 1500.**

The number of parking spaces proposed is 1,495 spaces.

RW.7 **The amount of quality green civic space in the design is much lower than needed to meet Comprehensive and neighborhood planning goals.**

SomerVision is a comprehensive, City-wide planning document. To assign its targets to the neighborhood scale, the Union Square Neighborhood Plan was developed over an 18-month community process and was adopted by the Planning Board. US2's redevelopment plan area represents a portion of the 'Union Square' area described in these planning documents and not the totality of future open space. The Neighborhood

Plan is clear in this distinction and estimates that the 'D Parcels' (the applicant's 'D Blocks') would contribute approximately two acres of new public spaces as they redevelop over time.' (Union Square Neighborhood Plan, page 47).

US2's CDSP application, in committing to approximately 2.5 acres of high-quality civic open space, 25% more than the Neighborhood Plan suggested, was found to be consistent with *SomerVision* and was approved by the Planning Board.

Wig Zamore
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March 4 2019

Matthew Beaton, Secretary
Executive Office of Energy and Environmental Affairs
Attention: MEPA Office / **MEPA Analyst Alex Strysky**
100 Cambridge Street, Suite 900
Boston MA 02114
RE: **Union Square Redevelopment EEA # 15889 Draft EIR**

Dear Secretary Beaton,

With apologies to you, to MEPA Analyst Alex Strysky and to the project proponents for submitting one business day late, I offer these brief comments on the Union Square Redevelopment Draft EIR. I would note that there was a one week extension in the comment period, which I appreciate, but also a longer than one week delay in sending out responses to some of the EENF comments. And that some of those responses, including to me with regard to traffic pollution and well-documented near roadway health effects, remain incomplete and inadequate as of today.

Proposed Land Uses and Consistency with SomerVision and MGL Chapter 41, Section 81D

I was a full community participant in the SomerVision planning process and believe in its goals. Accordingly, I have no problem with this project's proposed density, heights or allocation of building land uses among residential and commercial property. SomerVision's goal of live work balance, including 6000 new housing units, 20% affordable, and 30,000 new jobs is terrific! The intent to put most new development in transformative districts is appropriate. I also hope the developers and their funders make a good return on their investments in Somerville.

I have serious reservations about the timing and locations of some of the proposed open space, as well as the total amount. The first phase of this project - D2.1, D2.2 and D2.3 – proposes 15,100 square feet (SF) of open space between the phase 1 buildings and heavily congested Prospect St. While this corridor should be pleasant, the traffic air pollution will be far too voluminous for this to be regarded as a healthy location for members of the public to spend long periods of time here. A portion of the second phase of the project – D3.1 – proposes to add an additional 16,000 SF of open space, which is unfortunately also along the congested and polluted Prospect / Webster corridor. While vehicles may become more electrified, reducing tailpipe emissions, the street canyons due to new Union Square building walls will increase pollution levels and exacerbate the situation.

The cardiovascular, pulmonary and cognitive impacts of traffic pollution are well established within the global environmental epidemiology community even if EPA NAAQS fails to yet recognize specific components of that pollution. A local research group that includes members of the Somerville Transportation Equity Partnership (STEP) and Tufts University has published peer reviewed research documenting the relationship of Somerville traffic generated ultrafine particle (UFP) pollution and cardiovascular risk. Our CAFEH study focused on the I93 and Broadway corridors. But using the same measurement equipment for a Union Square Study done in partnership with the City of Somerville we have shown significant UFP pollution in Union Square, even in summertime.

I do believe that the late phase 27,000 square foot open space on D1.2 is well located, though it would be more valuable to the community if a bit larger, which might be able to be accomplished if the attached garage were to have a slightly smaller footprint but an additional floor.

The early phase open space contributions of the Union Square Redevelopment would be far more pleasant and far less traffic polluted if concentrated within the center of the D2 block, instead of on its Prospect Street edge. Much of the great public space in the world is located within city blocks rather than adjacent to the busiest and most polluted surrounding streets. Boston's Quincy Market could easily fit within a better designed D2 block, as could Piazza Navona from Rome. Such a plan would also allow eventual high density re-development of the Allen Street side of the D2 Block instead of placing a large multi-story garage and long alley in these neighbors' backyards.

Lastly but perhaps most importantly with regard to the proposed Union Square Redevelopment open space, its amount falls far short of what is called for in SomerVision, the communities' approved plan. And short of what is desperately needed by this community. Somerville currently has roughly 2 acres of public open space per 1000 residents, a truly pitiful amount only rivaled by Chelsea in Massachusetts. SomerVision calls for 7.5 million SF of new housing (6000 units at 1250 SF) and 7.5 million SF of new commercial space (at 4 jobs per 1000 SF). It also calls for 125 new acres of public open space. Thus, we need to create roughly one acre of new public open space for each 120,000 SF of new buildings. This development has almost 2.4 million SF. According to the SomerVision plan, we should create roughly 20 new acres of new public open space coincident with the Union Square Redevelopment, including on and off site. Instead this DEIR calls for a total of less than 2.5 public open space acres, most of that in later phases and much of it subpar for both recreation and congregation. Any local and / or state decision to approve the current Union Square Redevelopment proposal will fly in the face of MGL Chapter 41, Section 81D which asks that a Massachusetts municipal master plan be "...designed to provide a basis for decision making regarding the long-term physical development of the municipality". It would be extremely helpful if Secretary Beaton's response to this DEIR could include a mandate that the developers, city, community and state work hard, together, to much more successfully comply with Chapter 41, Section 81D in all respects, including the amounts and quality of proposed public open space. WZ.1

GLX Access

The current plans of the MBTA and this development do not include convenient access to the new Union Square GLX T Stop from Prospect Street. Direct access from Prospect Street onto the center of the station platform should be provided for virtually all riders, including those walking and those being dropped off by buses and / or the RIDE. The notion that the RIDE can be taken out of circulation and asked to drive three quarters of the way around the D2 block, including down a long proposed alley, is absolutely ridiculous. The inconvenience will be huge including to those coming from the Lincoln Park area of Somerville and from Inman Square in Cambridge. The RIDE and any other vehicles taken off the grid and around three quarters of the D2 Block will lose a significant amount of service time, wasting our collective investment in critical transit stock. A much better model would be to take a look at the Lake Street Station on the Pasadena CA Gold Line. That is an extremely efficient connection from the street grid of Pasadena for all Gold Line users - pedestrians, bicyclists, bus riders, "kiss and drop", and the mobility challenged. We need to remember that transportation is the largest US generator of Green House Gases and Black Carbon! WZ.2

Thank you very much for the opportunity to comment, Wig Zamore

WIG ZAMORE

WZ.1 **Amount of open space falls far short of what is called for in SomerVision.**

SomerVision is a comprehensive, City-wide planning document. To assign its targets to the neighborhood scale, the Union Square Neighborhood Plan was developed over an 18-month community process and was adopted by the Planning Board. US2's redevelopment plan area represents a portion of the 'Union Square' area described in these planning documents and not the totality of future open space. The Neighborhood Plan is clear in this distinction and estimates that the 'D Parcels' (the applicant's 'D Blocks') would contribute approximately two acres of new public spaces as they redevelop over time.' (Union Square Neighborhood Plan, page 47).

US2's CDSP application, in committing to approximately 2.5 acres of high-quality civic open space, 25% more than the Neighborhood Plan suggested, was found to be consistent with *SomerVision* and was approved by the Planning Board.

WZ.2 **The current plans of the MBTA and this development do not include convenient access to the new Union Square GLX T Stop from Prospect Street. Direct access from Prospect Street onto the center of the station platform should be provided for virtually all riders, including those walking and those being dropped off by buses and / or the RIDE. The notion that the RIDE can be taken out of circulation and asked to drive three quarters of the way around the D2 block, including down a long proposed alley, is absolutely ridiculous. The inconvenience will be huge including to those coming from the Lincoln Park area of Somerville and from Inman Square in Cambridge. The RIDE and any other vehicles taken off the grid and around three quarters of the D2 Block will lose a significant amount of service time, wasting our collective investment in critical transit stock.**

US2 has planned for a drop-off area that includes a designated area for the MBTA's The Ride paratransit program adjacent to the Union Square Station on Charlestown Place. Providing the drop-off in this location was critical to adhering to the MBTA's requirement that The Ride be located within 100 feet of the station entry. Charlestown Place can be accessed from the east via Charlestown Street (existing) or from the north via Milk Alley (proposed on D2). Milk Alley can be accessed directly from Somerville Avenue or from Prospect Street via Bennett Court.

[LETTERS OF SUPPORT]

Letters of Support

Secretary Matthew Beaton
Executive Office of Energy and Environmental Affairs
Attn: Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Re: EEA# 15889 Union Square Redevelopment DEIR

Mr. Strysky,

I am writing to communicate my support of the comprehensive analysis of impacts and associated mitigating efforts described in the applicant's Draft Environmental Impact Report submitted for the Union Square Redevelopment (EEA# 15889) project. It is evident that US2's application took very seriously the directives of the scoping letter delivered through the EENF Certificate and has delivered on all counts, a few of which are deserving of specific emphasis.

Expanding on the project scope to capture impacts of the full project has facilitated what is a thorough alternatives analysis. This includes varied use mixes and a reduced-build scenario that permit a quantitative comparison of impacts and project benefits. The findings outlined within are affirming of foundational Union Square-specific planning documents that identified the means by which transit-centric development would yield the broadest range of benefits to the community.

Leveraging the arrival of the Green Line to transform Union Square into an economic center that prioritizes job creation means Somerville and the surrounding community finally stand to benefit from investments in exhaustive planning exercises that have resulted in the masterplan to restore contaminated and underutilized sites to productivity. With the redevelopment, commercial tax generation is projected to outpace the residential burden 3:1, a welcome reversal of the current norm in Somerville.

In concert with job growth, housing creation is critical to ensuring long term area vitality and affordability. Having worked in the development of affordable housing, I can enthusiastically support the delivery of what I understand will be the largest delivery of inclusionary units in Somerville's history with the redevelopment's first phase. More important than scale and number of units, in a region enduring a housing crisis, a project that provides access to housing across multiple income tiers and household sizes as this project will, is one to be proud of.

Whether commercial or residential, the redevelopment project will also lead in its approach to sustainability. All buildings over 50,000 square feet with be LEED Gold certifiable under the new LEED version, which to my knowledge is an achievement without precedent in Somerville. In summary, the redevelopment proposal described in the DEIR stands as an example to follow. It is consistent in its delivery of Somerville 'firsts' and 'mosts' with commitments to mitigation, whether through financial commitments, planning elements, or design detail that position it for the long term.

Sincerely,

Jonathan Andrews

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Matthew A. Beaton

Secretary Executive Office of Energy & Environmental Affairs

Attention: MEPA Office – c/o Alex Strysky alexander.strysky@state.ma.us

Re: Union Square – EEA No. 15889 (Union Square Revitalization Project)

Dear Secretary Beaton:

As the owner of Bent Electrical Contractors Inc. and a proud Somerville resident, I am both personally and professionally invested in the growth of our community. I write today, to express my strong support for the redevelopment of this neighborhood by the US2 project. I believe in the Union Square neighborhood and have been participating in this project through the planning process for close to five years. I look forward to the vibrancy this project could add to our home and offer my support for the DEIR submitted by US2.

Bent Electrical Contractors is one of New England's leading full-service Union electrical contractors. Since 1979, we have been providing quality electrical contracting services to the Greater Boston area, but our home is in Somerville. As a business owner and a resident of Somerville, it is important to the City of Somerville to approve the Draft Environmental Impact report and have this project proceed.

The DEIR includes an infrastructure analysis that determines the utility infrastructure is adequate for the project and includes a Mobility Management Plan that is intended to minimize cars on the road and promote alternative modes of transportation. Reducing the number of vehicles on the road will help improve air quality and the numerous sidewalk and bike lane improvements will make Union Square more accessible and pedestrian friendly.

I applaud the project's work to minimize Greenhouse Gas Emissions. It is important that as members of the community we support development that has long term benefits and works to respect the environment. The Draft Environmental Impact Report contains real, concrete solutions to minimize Greenhouse Gas emissions in the designs of the buildings. I want to live in a city that cares about the preservation of the environment, and Somerville's support of this project will help us to become a more sustainable city.

Currently, Somerville lacks the green space necessary to minimize carbon dioxide levels and absorb heat in the summertime. This development includes approximately 108,600 square feet of new open green space that will benefit not only the environment, but also the community as a whole. Green space

encourages a more active populace and fosters a sense of community through bringing people together outdoors. These spaces also attract visitors who want to spend time outdoors.

In addition, we are suffering from a housing crisis. The $10.9 million in linkage funds created by the project will help Somerville develop more affordable housing for community members that in turn will benefit Somerville's economy as these residents have money to spend at local businesses. These linkage funds will have long term benefits to the entire region.

We are very excited for the revitalization of Union Square to begin and support the project so Somerville may begin to enjoy the many public benefits promised by this project.

Thank you for your consideration.

Sincerely,

Thomas Bent

President/CEO

Bent Electrical Contractors Inc.

59A Inner Belt Road

Somerville, Ma 02143

Webster Avenue Realty Trust
c/o Black Swan Management, LLC
258 Andover Street
Georgetown, MA 01833

February 22, 2019

Secretary, Mathew Beaton
Attn: MEPA Office, Alex Strysky
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Re: EEA No. 15889

I write to offer my support for the Union Square Revitalization project and to recommend an expeditious completion of the MEPA environmental review process for the project.

Webster Avenue Realty Trust owns the property at 50 Webster Avenue, Somerville, a key parcel in the Union Square Redevelopment, and we have been looking forward to the arrival of the Green Line to Union Square for many years. US2's project will provide critical improvements to the City's infrastructure and provide open spaces. The environmental benefits of the new tree canopy and landscape areas will be plentiful and for the enjoyment and use of residents and visitors.

The Union Square Redevelopment project will transform underutilized land, much of which needs to be remediated, to create an economic center in Somerville that is supported by a mix of uses. The DEIR includes a comprehensive transportation analysis, which contains the analysis of vehicle, transit, bicycle and pedestrian impacts.

After years of significant studies being undertaken with regard to the project, I believe that the Draft Environmental Impact Report is complete and addresses environmental, transportation and community concerns about the proposed development.

Thank you for your time and consideration.

Sincerely,

Peter Brown

Secretary Matthew Beaton
Executive Office of Energy and Environmental Affairs
Attn: Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Re: EEA# 15889 Union Square Redevelopment DEIR

Mr. Strysky,

I am writing to again express my continued support of the Union Square Redevelopment project and the submitted Draft Environmental Impact Report.

Since the time I last wrote, the development team has continued to evolve the design publicly. Since my last letter referencing an August 20, 2018 meeting, there have been more Design Review Committee meetings with subject professionals, and another neighborhood meeting. The positive direction in which we were headed has only improved with private building area giving way to create a larger public plaza adjacent the green line.

The change is evidence of the applicant's prioritization of the public realm – specifically on the first development block, where the plaza provides for universal access to the future Green Line Station. I am further encouraged by how climate resiliency is addressed through surface permeability specifications and a new urban tree canopy. As an architect, urban enthusiast, and Somerville resident, I understand that this approach carried through the over 100,000 square feet of new public open spaces is resilient and strategic planning at its core, responsive to Somerville's specific climate vulnerabilities to high-heat days and precipitation risk. These improvements are the actions that benefit everyone, and there is sincere excitement in the community as we await these changes that prepare and protect Somerville for future generations.

The DEIR shows the US2 team has been transparent and communicative as to the realities and benefits of the redevelopment project. The team even investigated the potential of an alternative community design plan, incorporating the feasible elements into the latest design iteration. Ultimately, the DEIR is comprehensive in its approach to describing impacts along with appropriate mitigation, and exemplifies what a transit-oriented development can and should be when community, City and private stakeholders collaborate to define and prioritize a sustainable future.

Thank you for your time and consideration.

Sincerely,
Josh Carel
44 Florence St, Somerville.

From: Joshua Van Dyke
To: Strysky, Alexander (EEA)
Subject: EEA# 15889
Date: Tuesday, February 12, 2019 1:26:25 PM

Dear MEPA Office:

As the owner of NU Kitchen, a café located at 195 Washington Street in Union Square, Somerville, I am both personally and professionally invested in the growth of this neighborhood. I wanted to write to express my support for the redevelopment of this neighborhood.

The community's vision of Union Square as an employment center built around transit is one that will benefit everyone – residents, businesses and current and future employees. The Project includes significant financial contributions, over $35 million, towards mitigating project impacts and addressing City and community priorities.

In addition to the $5.8 million for the GLX project, the project is providing $3.8 million for a community benefits fund, and approximately $3.6 million for other City and community needs. US2's support for key pedestrian and bicycle improvements and its commitment to a forward-thinking transportation management plan and reduced parking will bolster this growth.

I look forward to the day when my business is full of new workers and residents in Union Square and when the majority of my patrons arrive by bicycle, by foot or by bus/MBTA. I believe that day will come sooner with the completion of the GLX project and the redevelopment of Union Square.

Please let me know if I can be of any assistance as you evaluate US2's DEIR.

All the best,

Joshua Van Dyke
Founder & CEO, NU Kitchen
www.thenukitchen.com

Holiday Inn Boston-Bunker Hill
30 Washington Street
Somerville, MA 02143
P: 617.628.1000
F: 617.628.0143

Holiday Inn
BOSTON-BUNKER HILL

February 22, 2019

Matthew A. Beaton
Secretary Executive Office of Energy & Environmental Affairs
Attention: MEPA office c/o Alex Strysky alexander.strysky@state.ma.us

Re: Union Square – EEA No. 15889 (Union Square Revitalization Project)

Dear Secretary Beaton:

I write on behalf of the Holiday Inn Boston Bunker Hill (DDH Hotel Somerville LLC.) I would like to voice my strong support for the Union Square Revitalization Project proposed by US2. I believe that the DEIR was thorough in its description of the Project and addresses the impacts associated with the Project and the proposed mitigation.

The DEIR includes an infrastructure analysis that determines the utility infrastructure is adequate for the project and includes a Mobility Management Plan that is intended to minimize cars on the road and promote alternative modes of transportation. Reducing the number of vehicles on the road will help improve air quality and the numerous sidewalk and bike lane improvements will make Union Square more accessible and pedestrian friendly.

The proposed project will be key to the revitalization of Union Square as a transit orientated center. The project adds tremendous value to Union Square and has been designed to best service our friends, families, visitors to our neighborhood, and support our local business owners.

Sincerely,

Jim Harvey

Jim Harvey
General Manager
Holiday Inn Boston Bunker Hill
jharvey@distinctivehospitalitygroup.com

Green Cab Co, Inc.
600 Windsor Place
Somerville, Ma 02143

Choran.greencab@yahoo.com

EEA No. 15889

I am writing as a local business owner to voice my strong support for the Union Square Revitalization Project proposed by US2.

I am the owner of Green Cab in Boynton Yards. We have been in business in Somerville since the 1970s. I was also born and raised in Somerville and still have strong ties to Somerville and its residents. I believe strongly in the Union Square neighborhood, I have been an active participant in the Union Square planning process, and I look forward to seeing the neighborhood's revitalization move forward.

The community has worked long and hard, in close cooperation with US2, to develop a shared vision of Union Square as a commercial and employment hub built around the new Union Square Green Line Station. It is critical that we now move forward with approvals for the US2 project, so the community can begin to see the benefits, including the creation of a mixed-use employment center that enables residents to live in close proximity to transit and to new jobs.

Throughout the planning process, proactive approaches to sustainability, mobility management and climate change adaptation have been part of the vision for the project. It is great to see these values and concrete approaches to mitigating project impacts reflected in the DEIR. I support resolution of the MEPA process so that the project can begin and Somerville may begin to enjoy the many public benefits promised by this project.

Sincerely,
Cheryl Horan
Vice President
Green Cab Co, Inc.

EEA# 15889

Dear MEPA office:

The Union Square Project will generate millions of dollars in revenue for the City of Somerville. The Project will add approximately 5,300 new jobs to the neighborhood (making it truly mixed-use).

The project will also create approximately 200 (much needed) permanently affordable housing units on-site, in addition to the approximately $10.9 million in housing linkage funds to support additional affordable housing in the City.

This project will go a long way in created a transit-oriented City that is good for business, residents and visitors. I support the Union Square DEIR.

Sincerely,
Somerville Resident
Andrew Lalli

From: Jack Connolly
To: Strysky, Alexander (EEA)
Subject: Letter of Support for the DEIR submitted by US2
Date: Friday, February 22, 2019 11:33:51 AM

EEA# 15889

MEPA Office Executive Office of Energy and Environmental Affairs
100 Cambridge Street Suite 900
Boston, Massachusetts 02114

Dear Mr. Strysky,

The Union Square development project is of vital importance to the City of Somerville. As a former City Alderman (Ward Six and At Large) who served Somerville as an elected official for over three decades, I would like to express my strong support of the DEIR.

US2, the developer for the project, has worked extensively and cooperatively with the City of Somerville for many years. US2 and city officials have worked hard, together with the community, to come up with a development plan and project that reduce the effects of construction on the City. All of the involved parties have examined the impact of the development from every angle and have taken the appropriate planning and zoning measures to create with a development that works for Somerville. As an Alderman, I helped to pass some of those zoning measures. In addition to the work in Union Square, I have spent a major part of my public life working with citizens, businesses, and regional and local Government entities' to bring the Red Line into Davis Sq., the Orange Line to Assembly Sq., and now the Green Line to Union sq.

The development will create a surge of economic activity in the area around Union Square. The mixed uses planned for the development will drive folks to Union Square, just as Davis Sq. was revived and energized after the opening of the Red Line in Davis Sq. (1984). More importantly, tax revenue from the development will greatly assist Somerville in meeting its costs, especially since the City Somerville has obligated $50,000,000 towards the construction of the Green Line.

The Union Square development has been under review for many years, so I ask that you approve the DEIR to advance the development one step closer to the finish line. I welcome your call or questions anytime: I am glad to speak at length regarding the extremely positive benefits that this Union Square development project will bring to the City of Somerville.

With My Very Best Regards,

Jack

John M. 'Jack' Connolly Mobile # 617-838-7077
17 Winslow Ave. Somerville MA 02144

EEA No. 15889

Like other property owners and residents in Somerville's Union Square neighborhood, I have been looking forward to the arrival of the Green Line for many years, and have been closely following the public process for the neighborhood's redevelopment.

The project's improvements to the streetscape and pedestrian realm will provide better conditions for pedestrians and bicyclists. In addition to Green Line transportation access, the Union Square Development will minimize the need for cars on the road and encourage alternative modes of public transportation. And most importantly, the Union Square revitalization project will bring jobs to Union Square along with substantial economic benefits to local businesses, and Somerville as a whole.

I am looking forward to the day that I can walk from the doorstep of our buildings to the T, greeted by a beautiful, modern, and safe public plaza. I support the Union Square Project and appreciate that the Draft EIR was thorough in its description of the Project, the impacts associated with the project and the proposed mitigation. I am hopeful that no further studies are required and that the project can proceed and these benefits are not further delayed.

Thank you for your consideration,

Sincerely,

Brett Levy
Riverside Properties, Inc.

RECEIVED
FEB 27 2019
Executive Office of Energy
& Environmental Affairs

Matthew A. Beaton
Secretary Executive Office of Energy & Environmental Affairs
Attention: MEPA Office – c/o Alex Strysky alexander.strysy@state.ma.us

Re: Union Square – EEA No. 15889 (Union Square Revitalization Project)

Dear Secretary Matt Beaton,

I would like to express my support for the Union Square project that is currently under review by the Executive Office of Energy and Environmental Affairs. It is anticipated that the Union Square redevelopment will bring in a great deal of revenue for Somerville in the form of tax revenue and the economic activity that will flow from the project once completed. The redevelopment will also inspire other developers to invest in Somerville and, in particular, the area around Union Square.

As you are aware, the redevelopment of Union Square has been a hot topic in Somerville for quite some time. I was formerly a member of the Somerville Board of Aldermen and had the opportunity to work on the plan, including reviewing and approving the final zoning for the project. I can assure you that for a decade Somerville and its elected officials have carefully studied the impacts of redeveloping Union Square on the City, including from zoning, environmental and permitting perspectives. It is very exciting to see all of those years of hard work paying off into a wonderful project that will foster growth in Somerville.

I support write today to voice my support that US2's DEIR analysis is comprehensive and shows the impaets of the project and describes appropriate mitigation for those impacts.

Sincerely,

Robert McWatters

From: Somerville YIMBY
To: Strysky, Alexander (EEA)
Subject: Public comment in support of EEA# 15889 Union Square Redevelopment Draft Environmental Impact Report
Date: Friday, March 01, 2019 11:27:38 AM

EEA# 15889

Dear Secretary Beaton:

We write in support of the Union Square Redevelopment Draft Environmental Impact Report.

Somerville YIMBY — Yes In My Back Yard — is a group of Somerville residents advocating for smart growth that benefits everyone. We're a part of a nationwide movement to increase the amount of housing available to people in cities that have suffered from gentrification and expensive market rate housing.

Like our friends A Better Cambridge, we support eco-friendly density and transit-centered growth to create vibrant, walkable, bikeable, livable neighborhoods with plenty of housing for all. We believe that our cities and towns are great places, and we should welcome people who want to be here by creating plenty of housing for new neighbors of all income levels.

We appreciate the work that US2 has done to engage in an extensive community planning process to shape the proposed project, and would like to see the project moved forward. The project provides clear environmental benefits:

- The project includes a number of measures to minimize the Project's greenhouse gas emissions. The DEIR includes a comprehensive GHG analysis that includes a number of alternatives that will be considered as the design of each building moves forward to minimize GHG emissions.
- The project is tightly linked with upgraded sewer and storm systems, which will reduce water contamination and improve climate resiliency.
- The project is critical to the completion of the Union Square MBTA station, which will enable Somerville to reduce car travel and increase sustainable mobility.
- Construction includes separated bike lanes and bike parking, again enhancing sustainable mobility for the community.
- The buildings on the site will be LEED Gold certified, with all the attendant environmental benefits that certification implies.

- Increased commercial and residential density near transit hubs like Union Square reduces auto trips and carbon emissions and is broadly in keeping with the sustainability goals of the city and the state.

This long-awaited development is an important part of both environmental and community goals for the city of Somerville.

Sincerely,

Somerville YIMBY Steering Committee

--
Somerville YIMBY
somervilleyimby.org
@SomervilleYIMBY
facebook.com/SomervilleYIMBY

From: Julia Travaglini
To: Strysky, Alexander (EEA)
Subject: Re: Union Square – EEA No. 15889 (Union Square Revitalization Project)
Date: Friday, March 01, 2019 1:35:21 PM

Dear Mr. Strysky,

As a member of the Greentown Labs team and a proud Somerville resident, I am both personally and professionally invested in the growth of our community. I write today, to express my sincere support for the redevelopment of this neighborhood by the US2 project. I believe strongly in the Union Square neighborhood and I look forward to the vibrancy this project could add to our community.

I write in support of US2's Draft Environmental Impact Report and its appropriate approach to Brownfield reuse and remediation. The developer's proposed technical solutions set forth a prudent, cost-effective plan to remediate significant environmental impacts while ensuring that the Union Square Revitalization project comes to fruition.

Urban renewal projects like US2's development are enormously beneficial when they allow heavily contaminated parcels of vacant land to achieve functional use. The importance of creating vibrant transit-oriented development and a new Union Square Green Line Station in the heart of a neighborhood once used to process chemicals and perform other 'dirty' uses cannot be understated.

US2's brownfield remediation program will help the community realize the enormous benefits associated with Union Square's redevelopment. The Somerville Redevelopment Authority's astute leverage of grants from the United States' Environmental Protection Agency and MassDevelopment provided the necessary financial resources to proceed with an urban renewal program in Union Square. US2's brownfield remediation plan will finish this work, allowing the site to support new homes and new jobs.

I'm excited to see the positive impact the Union Square Redevelopment will have on the community. Thank you for your time and consideration.

Sincerely,

Julia Travaglini
Somerville Resident
Sr. Director of Marketing, Chief of Staff
Greentown Labs

--

Julia Travaglini
Senior Director of Marketing, Chief of Staff

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February 28, 2019

Matthew A. Beaton
Secretary Executive Office of Energy & Environmental Affairs
Attention: MEPA Office – c/o Alex Strysky alexander.stryskey@state.ma.us

RE: Union Square – EEA No. 15889 (Union Square Revitalization Project)

Dear Secretary Beaton:

As a commercial lending officer for Rockland Trust Company, I am writing to support the Union Square Draft Environmental Impact Report because of the need for more affordable housing in Somerville. For the past 29 years I have witnessed the dramatic change in the Somerville housing market. Homes that were once vacant are now in heavy demand with ever spiraling prices. Available rental units are now scarce with increasing rents and displacement a serious concern. The Union Square project will bring with it approximately 200 affordable housing units to the neighborhood and will immeasurably benefit the community. These units will enable people to both live and work in Union Square, fostering a greater community identity.

The City of Somerville has declared a housing crisis. The project will raise $10.9 million in linkage funds which will lead to the development of more affordable housing for community members that in turn will benefit Somerville's economy as these residents will spend their money at local businesses. In addition, with more people able to afford living in Somerville, a larger pool of employees will be available to staff new businesses moving into the Square as well as existing businesses, thus helping to assure the project's success. These linkage funds will have long term benefits to the entire region.

I strongly believe that the DEIR submitted by US2 included an exhaustive analysis of the impacts as required by MEPA. I request no further studies or information be required.

The residents and businesses of the city are eager for the project to begin so that all may enjoy its benefits. Thank you.

Sincerely,

FVP

Lawrence P. Venezia
First Vice President
Lending Center Manager, Commercial Lending

ROCKLAND TRUST Where Each Relationship Matters®

February 28, 2019

Matthew A. Beaton
Secretary Executive Office of Energy & Environmental Affairs
Attention: MEPA Office – c/o Alex Strysky

Re: Union Square – EEA No. 15889 (Union Square Revitalization Project)

Dear Secretary Beaton:

As Vice President in Business Banking at Rockland Trust, I write in support of the Union Square Draft Environmental Impact Report because of the need for more affordable housing in Somerville. Adding approximately 200 affordable housing units to Union Square will immeasurably benefit the community. These units will enable people to both live and work in Union Square, fostering a greater community identity.

In addition, we are suffering from a housing crisis. The $10.9 million in linkage funds created by the project will help Somerville develop more affordable housing for community members that in turn will benefit Somerville's economy as these residents have money to spend at local businesses. These linkage funds will have long term benefits to the entire region.

I strongly believe that the DEIR submitted by US2 included an exhaustive analysis of the impacts as required by MEPA. I request no further studies or information.

Sincerely,

Charles Gray
Vice President, Business Banking

Member FDIC

SomerVille
CHAMBER OF COMMERCE

2 Alpine Street, P.O. Box 440343 Somerville, MA 02144
www.somervillechamber.org

March 1, 2019

Matthew A. Beaton
Secretary Executive Office of Energy & Environmental Affairs
Attention: MEPA Office – c/o Alex Strysky alexander.strysky@state.ma.us
100 Cambridge Street, Suite 900 Boston, MA 02114

RE: Union Square Redevelopment Project, EEA #15889

Dear Secretary Beaton:

On behalf of the Somerville Chamber of Commerce I am writing in strong support for the Union Square Redevelopment Project (Project) proposed by US2.

This Project and the Green Line Extension have under gone exhaustive public planning processes over the course of the past decade. The Project is consistent with our community's SomerVision Comprehensive Plan, state-approved Urban Revitalization Plan, and the award-winning Union Square Neighborhood Plan. From a community perspective, the Project may be creating the most consequential transit-oriented development in New England.

For a city with an unusually small commercial tax base and municipal budget per capita, the Project will generate millions of dollars in revenue to support public works, public safety and public education. For a city with half as many local jobs as residents in the workforce, the Project will move the community within reach of a 1 to 1 job to worker ratio. For a city with an acute demand for housing, the Project will generate approximately 1,000 new residential units with approximately 200 permanently affordable. For a city with a paucity of space, the Project will bring a network of eleven new green, open and civic spaces for workers, residents and visitors. For the most densely populated city in New England, the Project will be an outstanding application of the ten principles of Smart Growth.

The Chamber would like to offer our support for the Draft EIR submitted by US2 as it provides a thorough description of the Project and discusses the impacts associated with the Project and the proposed mitigation. We are happy to discuss our support for the Project upon your request. We hope that the application submitted by US2 is decided upon favorably.

Sincerely,

Stephen V. Mackey, President/CEO
smackey@somervillechamber.org O 617-776-4100 M 617-413-5071
CC: Mayor Joseph Curtatone mayor@somervillema.gov
City Clerk John Long cityclerk@somervillema.gov
City Council citycouncil@somervillema.gov

From:	Scott Hayman
To:	Strysky, Alexander (EEA)
Cc:	greg@discoverusq.com
Subject:	Union Square – EEA No. 15889 (Union Square Revitalization Project)
Date:	Friday, March 01, 2019 2:12:39 PM

Matthew A. Beaton
Secretary Executive Office of Energy & Environmental Affairs
Attention: MEPA Office – c/o Alex Strysky alexander.strysky@state.ma.us

Re: Union Square – EEA No. 15889 (Union Square Revitalization Project)

I writed to extend my support for the revitalization of Union Square. US2 has been a trustworthy friend for the Somerville community, and has helped Somerville realize a number of its planning goals to encourage development.

The Draft EIR submitted by US2, includes information about other alternatives studied for the project site and the associated benefits and environmental impacts:

- Approximately $3.5 million in inflow and infiltration payments
- Approximately $10.9 million in housing linkage
- Approximately $2.9 million in jobs linkage

In addition the Project provides improvements to the streetscape and pedestrian realm adjacent to the Blocks that will provide improved conditions for pedestrians and bicyclists.

I offer my strong support for the DEIR submitted by US2. I look forward to enjoying the many benefits that the USQ Project will create in an already vibrant community.

Thank you for your consideration.

Scott Hayman

Director of Real Estate

Sommerville Community Corporation

From: Don Hughes
To: Strysky, Alexander (EEA)
Subject: Union Square – EEA No. 15889 (Union Square Revitalization Project)
Date: Wednesday, February 27, 2019 6:43:50 PM
Attachments: image001.png

February 27, 2019

Matthew A. Beaton
Secretary Executive Office of Energy & Environmental Affairs
Attention: MEPA Office – c/o Alex Strysky alexander.strysky@state.ma.us
Re: Union Square – EEA No. 15889 (Union Square Revitalization Project)

Dear Secretary Beaton:

I am writing I write to voice my strong support for the Union Square Revitalization Project proposed by US2.

As a Somerville resident of over thirty years, I would like to take this opportunity to extend my support for the Draft EIR submitted by US2. US2 has been a trustworthy partner for the Somerville community, and has helped Somerville realize a number of its planning goals to encourage development.
The DEIR accounts for many benefits, including:

- Supporting people: pedestrians, bicyclists and transit riders of all ages and abilities
- Relieving pressure on the Somerville housing market by supporting a mixed-use employment city that
  enables residents to live in close proximity to transit and to new jobs
- Offering additional commercial space that will be a catalyst for job development

I support the Union Square Redevelopment and its Draft Environmental Impact Report.

Sincerely,

Don Hughes
180 North Street
Somerville, MA 02144

Compassionate, integrated behavioral healthcare & human services.

CONFIDENTIALITY STATEMENT: This message contains information from Riverside Community Care that is confidential

From: Stuart Landucci
To: Strysky, Alexander (EEA)
Subject: Union Square – EEA No. 15889 (Union Square Revitalization Project)
Date: Tuesday, February 26, 2019 8:35:05 PM

Dear Secretary Beaton:

As Cambridge resident, I write today, to offer my sincere support for the redevelopment of this neighborhood by the US2 project. I have a tremendous amount of respect for the Union Square neighborhood and have been following the dialogue surrounding the project throughout the planning process. I look forward to the enthusiasm this project could add to our community and offer my support for the Draft EIR submitted by US2.

The redevelopment of the D2 block is a vital aspect of the future of Union Square. This will help transform Union Square into a mixed-use employment center that will allow residents to live in close proximity to transit and work.

Additionally, I would like to communicate my support for redevelopment of the Green Line station. The alignment of the two projects creates needed momentum to reach project goals that benefit our community.

I appreciate the opportunity to voice my endorsement for this project. I am humbled by the outreach and the support that has been generated by the community for this project. I look forward to enjoying the benefits alongside residents, business owners and new friends to the neighborhood.

Thanks

Stuart Landucci

From: Jimi Oke
To: Strysky, Alexander (EEA)
Subject: Union Square EEA 15889
Date: Thursday, February 21, 2019 1:47:27 PM

Secretary Matthew Beaton
Executive Office of Energy and Environmental Affairs
Attn: Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Re: EEA# 15889 Union Square Redevelopment DEIR

Dear Mr. Strysky

As Union Square residents, and transportation professionals working in consulting and on future mobility, we write again to express our continued support for the Union Square redevelopment project. As active commuters who traverse several of the redevelopment sites daily along Webster Avenue on our way to jobs in Cambridge and Boston, we are greatly encouraged by the exhaustive transportation impact study that has been prepared because we understand the rarity of the 60% non-automotive mode share described within.

As pedestrian-commuters ourselves, this pedestrian-centric plan is one that enhances the livability and safety of our streets and neighborhood. The proposed 12-foot sidewalks and investments in offsite infrastructure for dedicated bike lanes, street trees and green infrastructure are mechanisms by which more automobile users are invited to become pedestrians, cyclists, and transit riders. This behavioral change represents true mitigation and is what the community, city, and applicant US2 have been planning for nearly a decade. The longer we delay these enhancements for pedestrians and their access to transit in parallel with the delivery of new commercial space and jobs locally, the longer we, and many of our neighbors, continue to leave Somerville to go work; the longer we let the personal vehicle dominate our neighborhood. We need – the environment needs – this project.

We need this project to move forward in order to produce the multitude of benefits from this longstanding public private partnership. The analysis to date has been extensive and the DEIR more than addresses the proposals impacts and is descriptive in the mitigating efforts. We are more than ready for this project's benefits. Thank you for your time in consideration of our support.

Sincerely,
Jimi and Tolu Becks Oke

February 26, 2019

Secretary Matthew Beaton
Executive Office of Energy and Environmental Affairs
Attn: Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Mr. Strysky:

As a Somerville resident I am writing to again express my support of the Union Square Redevelopment's Draft Environmental Impact Report submitted by US2. I believe the DEIR was exhaustive in its analysis of impacts and thorough in explaining the mitigating efforts planned.

The multiple and varied benefits as described within are evidence of a public-private partnership that has organized around the arrival of much needed transportation alternatives to Union Square. The DEIR, in presenting the full project scope demonstrates the cumulative effects of both short-term and long-term mitigating efforts:

- Pedestrian-first planning to incentivize the most sustainable form of transportation for the long term, supporting the increased foot-traffic to grow local businesses
- Job creation and new commercial tax revenue to shift the tax burden away from residents
- New housing within a mixed-use context that provides access to transit, jobs, and neighborhood amenities, both present and future
- Millions of dollars dedicated to local benefit and area enhancements including contributions to the Green Line, off-site infrastructure improvements, community benefits, and future-phase contributions as specific needs arise
- Somerville's most sustainable new buildings supported by a network of new open spaces to include a new neighborhood park, community garden, public plaza and others

Itemizing only a few of the benefits and commitments outlined in the DEIR it is clear that US2 is committed to approaching mitigation holistically and will continue to be a trustworthy partner for the Somerville community. As this project is of direct impact on my neighborhood, I ask that these efforts might be recognized so that the years of planning to date might begin to produce the benefits that have long been envisioned for the benefit of all.

Sincerely,

Andrew Wade
24 Hanson Street #2
Somerville, MA 02143

WINTER HILL BANK®

February 26, 2019

Matthew A. Beaton
Secretary Executive Office of Energy & Environmental Affairs
Attention: MEPA Office – c/o Alex Strysky alexander.stryskey@state.ma.us

RE: Union Square – EEA No. 15889 (Union Square Revitalization Project)

Dear Secretary Beaton:

As a commercial lending officer for Winter Hill Bank, I am writing to support the Union Square Draft Environmental Impact Report because of the need for more affordable housing in Somerville. For the past 29 years I have witnessed the dramatic change in the Somerville housing market. Homes that were once vacant are now in heavy demand with ever spiraling prices. Available rental units are now scarce with increasing rents and displacement a serious concern. The Union Square project will bring with it approximately 200 affordable housing units to the neighborhood and will immeasurably benefit the community. These units will enable people to both live and work in Union Square, fostering a greater community identity.

The City of Somerville has declared a housing crisis. The project will raise $10.9 million in linkage funds which will lead to the development of more affordable housing for community members that in turn will benefit Somerville's economy as these residents will spend their money at local businesses. In addition, with more people able to afford living in Somerville, a larger pool of employees will be available to staff new businesses moving into the Square as well as existing businesses, thus helping to assure the project's success. These linkage funds will have long term benefits to the entire region.

I strongly believe that the DEIR submitted by US2 included an exhaustive analysis of the impacts as required by MEPA. I request no further studies or information be required.

The residents and businesses of the city are eager for the project to begin so that all may enjoy its benefits. Thank you.

Sincerely,

Kevin J. Gatlin
Senior Vice-President, Commercial Lending

WINTER HILL BANK®

February 27, 2019

Matthew A. Beaton
Secretary Executive Office of Energy & Environmental Affairs
Attention: MEPA Office – c/o Alex Strysky alexander.strysky@state.ma.us
Re: Union Square – EEA No. 15889 (Union Square Revitalization Project)

Dear Secretary Beaton:

On behalf of Winter Hill Bank and myself as a resident of Somerville, I write in support of the Union Square Draft Environmental Impact Report because of the need for more affordable housing in Somerville. Adding approximately 200 affordable housing units to Union Square will immeasurably benefit the community. These units will enable people to both live and work in Union Square, fostering a greater community identity.

In addition, we are suffering from a housing crisis. The $10.9 million in linkage funds created by the project will help Somerville develop more affordable housing for community members that in turn will benefit Somerville's economy as these residents have money to spend at local businesses. These linkage funds will have long term benefits to the entire region.

I strongly believe that the DEIR submitted by US2 included an exhaustive analysis of the impacts as required by MEPA. I request no further studies or information.

Yours truly,

Sandra L. McGoldrick

Sandra L. McGoldrick
President/CEO

SLM/md

Corporate Office: 342 Broadway, Somerville, MA 02145 • **Branch Offices:** Somerville • North Reading
Loan Center: 337 Broadway, Somerville, MA 02145 • **Operations Center:** 371 Summer Street, Somerville, MA 02144
Connecting All Departments 1-800-444-4300 • 617-666-8600 • Fax: 617-666-9647 • www.winterhillbank.com

WINTER HILL BANK

March 1, 2019

Matthew A. Beaton
Secretary Executive Office of Energy & Environmental Affairs
Attention: MEPA Office – c/o Alex Strysky alexander.strysky@state.ma.us
Re: Union Square – EEA No. 15889 (Union Square Revitalization Project)

Dear Secretary Beaton:

I am writing this letter in strong support for the Union Square Revitalization Project proposed by US2.

As a lender with Winter Hill Bank and the Treasurer of the Somerville Chamber of Commerce, I have been a part of the development that has taken place in Somerville. I have also participated in open forums to discuss the problem of affordable housing in Somerville and the surrounding areas. The US2 project will provide many benefits to the community that are in keeping with the SomerVision goals.

First, it will create commercial space which will be a catalyst for jobs and additional tax base revenue. Second, it will create 90 units of affordable housing, a significant addition to the affordable housing stock. Third, it will preserve open space for community enjoyment. Fourth, it will be economically conscious in its design to reduce greenhouse emissions.

Given the immediate needs of commercial space and affordable housing, it is crucial that the project proceed without additional roadblocks or delay. I support the Union Square Redevelopment and it's Draft Environmental Impact Report so that Somerville can enjoy the many benefits this project will provide.

Sincerely,

Richard M. Brenner

Richard M. Brenner
rmbrenner@winterhillbank.com
617-629-3349

RECEIVED
FEB 28 2019
Executive Office of Energy
& Environmental Affairs

Attention: MEPA Office – c/o Alex Strysky

Re: Union Square – EEA No. 15889 (Union Square Revitalization Project)

Dear Secretary Beaton,

I write today to offer my support for US2's DEIR analysis. My family and I have been residents of Union Square for 16 years. We are very excited about the benefits, many of them environmental, that the Union Square Revitalization project will bring to our community after years of careful planning.

The D2 site has been a vacant, contaminated site since 2013. The redevelopment will remediate the site and create new places to live - including new affordable housing - and also function as new green and open spaces. The project also includes environmental building standards like LEED Gold and commitments to going further to reduce greenhouse gas emissions. I'm also excited about new pedestrian and bicycle improvements that will make our neighborhood easier to navigate.

More than anything, I am excited to see the start of commercial development in Union Square that has been a goal of Somerville's for years. Commercial development relies on having a successful MBTA Green Line Station located in Union Square. While US2 is not responsible for the development of the green line rail, I understand the developer is responsible for creating employee facilities, ADA access to the platform, a dedicated location for The Ride Drop-off/Pick-Up and pedestrian access through the D2 parcel to the platform. All of these basic functions need to be available when Union Square Station opens in 2021.

Union Square residents and business owners have fought a long time to see the Green Line extension – a significant environmental benefit itself. Delaying any further would be a disservice to all of the potential customers who have waited a long time for reliable transportation. I believe that US2's DEIR analysis is comprehensive and shows the project impacts and describes the appropriate mitigation for those impacts. We don't have to wait any longer for GLX, commercial development, or the project benefits.

Thank you,

Zac Zasloff
12 Munroe Street
Somerville MA 02143

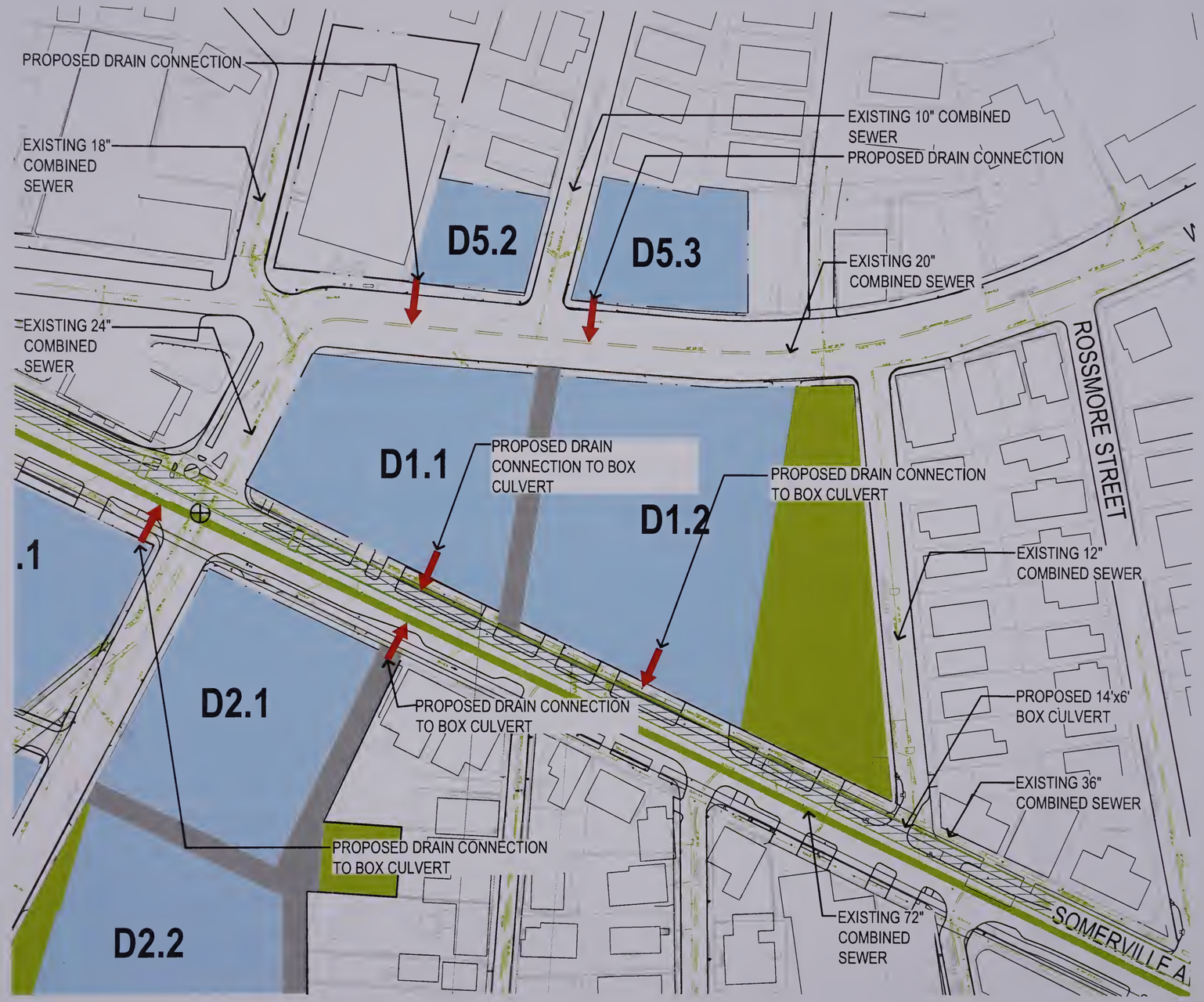
Drainage, Sewer, and Water Plans
D2 Building Elevations

0 50' 100' 200'

Union Square **Somerville, Massachusetts**

Stantec

Overall Drainage Plan



Union Square Somerville, Massachusetts

0 50' 100' 200'

Stantec

Overall Drainage Plan

Union Square **Somerville, Massachusetts**

0 50' 100' 200'

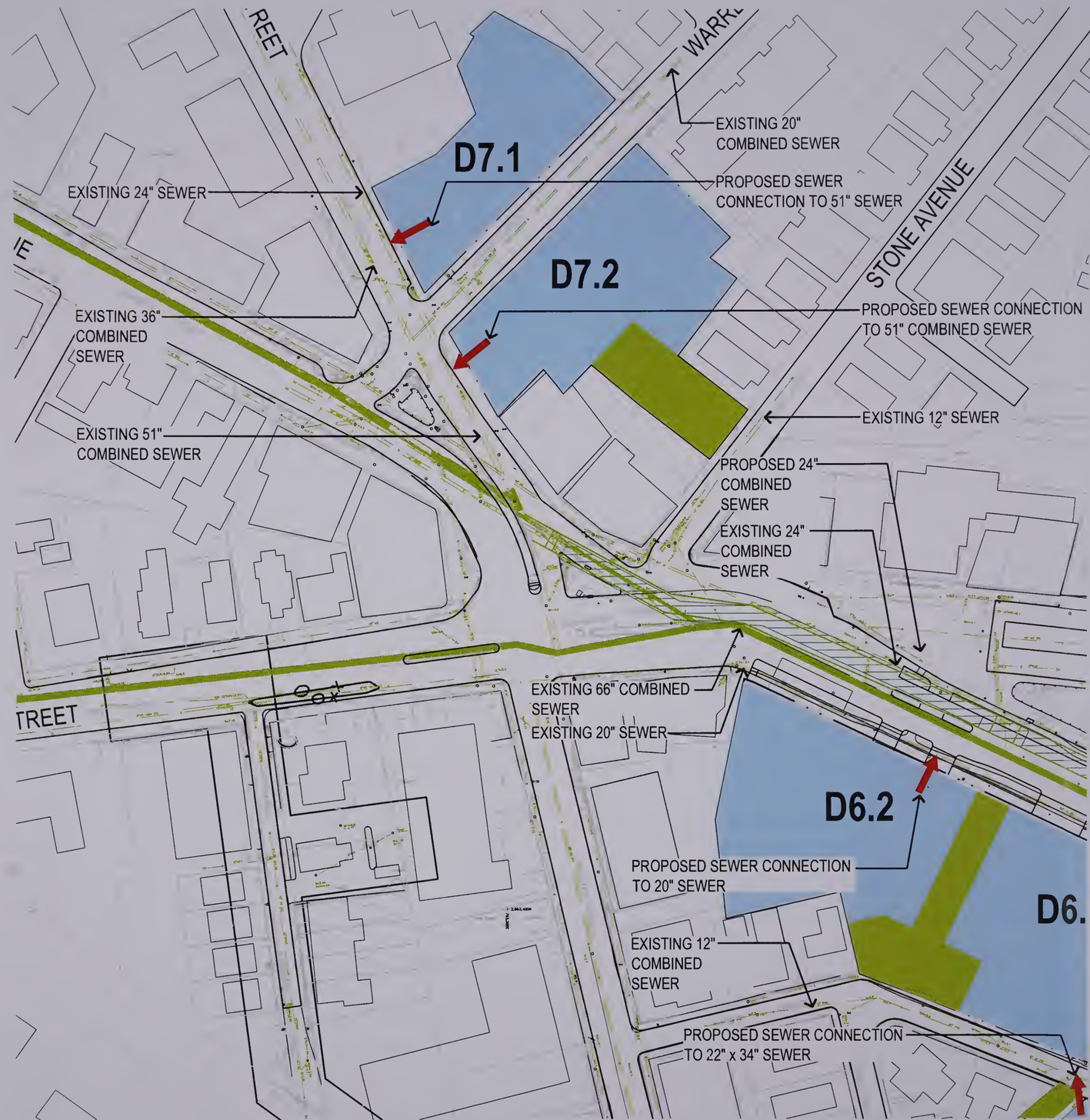
Stantec

Overall Drainage Plan

Union Square **Somerville, Massachusetts**

Stantec

Overall Drainage Plan



Union Square **Somerville, Massachusetts**

Stantec

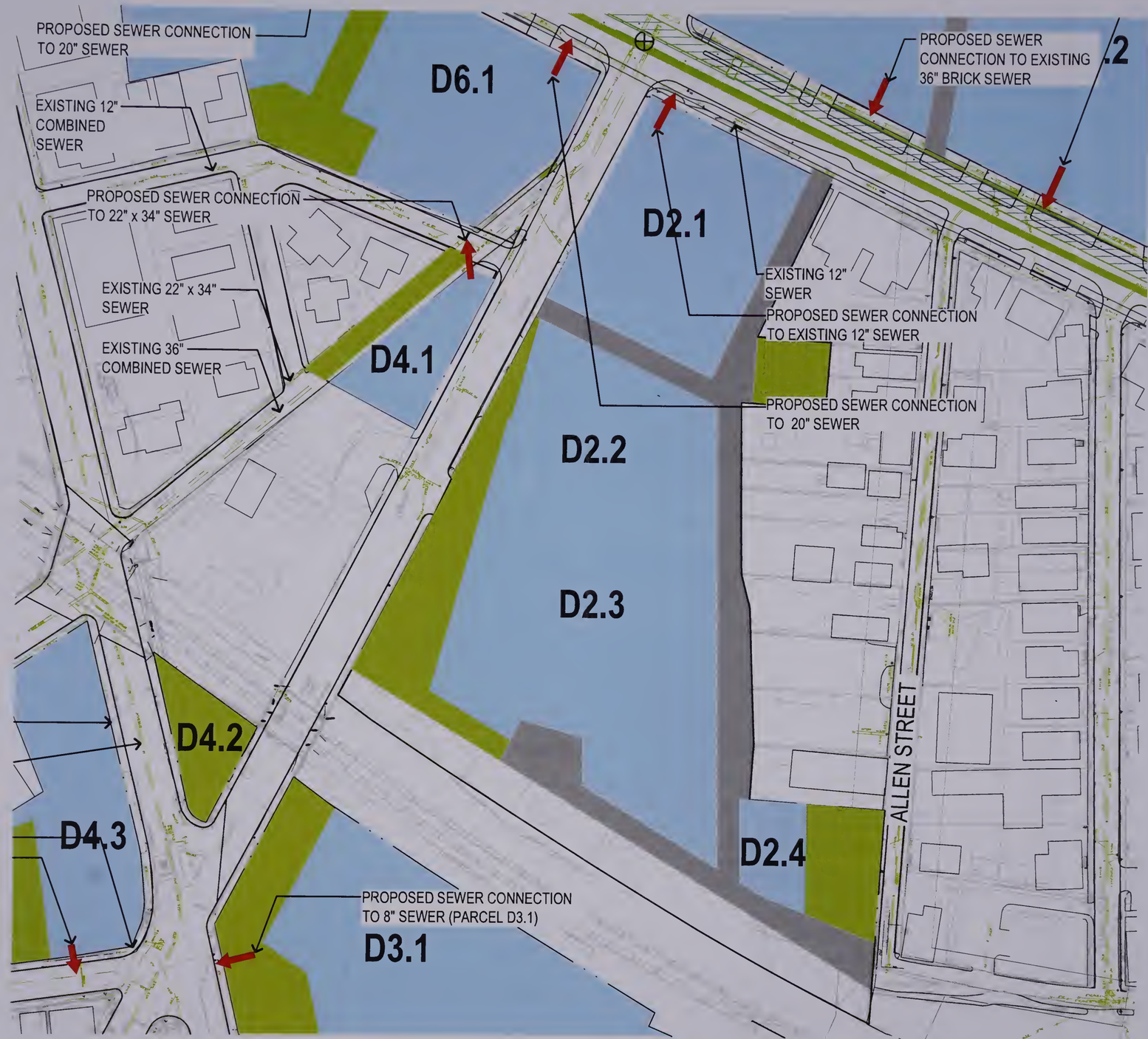
Overall Sewer Plan

Union Square Somerville, Massachusetts

0 50' 100' 200'

Stantec

Overall Sewer Plan



Union Square Somerville, Massachusetts

Stantec

Overall Sewer Plan

Union Square Somerville, Massachusetts

Stantec

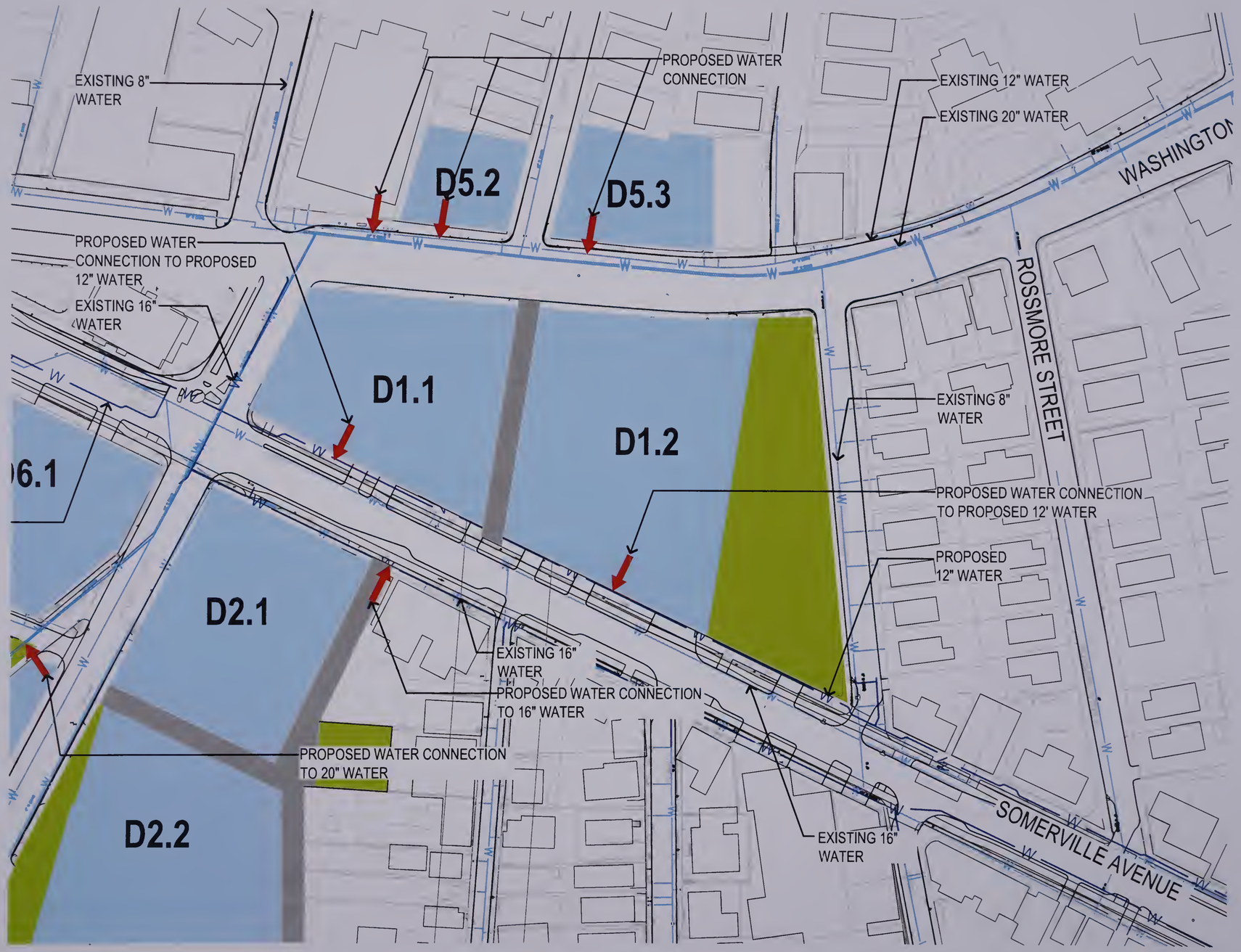
Overall Sewer Plan

Union Square **Somerville, Massachusetts**

0 50' 100' 200'

Stantec

Overall Water System Plan



Union Square **Somerville, Massachusetts**

0 50' 100' 200'

Stantec

Overall Water System Plan

Union Square Somerville, Massachusetts

0 50' 100' 200'

Stantec

Overall Water System Plan

Union Square **Somerville, Massachusetts**

0 50' 100' 200'

Stantec

Overall Water System Plan

46'-0"
33'-0"
33'-0"
33'-0"
32'-0"
Metal panel at roof screen
Metal panel at enclosed penthouse with integrated mechanical louvers
Glass and/or metal railing at outdoor space
Vision glass
Spandrel glass
Vertically orientated cladding
Accent panel
Horizontal metal banding
Vertically orientated cladding
Vertical metal accent
Mechanical louvers
Granite base
INDUSTRY WEST
LAUNCH49
SILICA
COPPER
approx. 17'-0"
21'-6"
15'-6"
14'-6"
14'-6"
14'-6"
14'-6"
14'-6"
20'-0"
TOP
MIDDLE
BASE
SOMERVILLE AVENUE
BENNETT COURT

Union Square **Somerville, Massachusetts**

D2.1 North Building Elevation

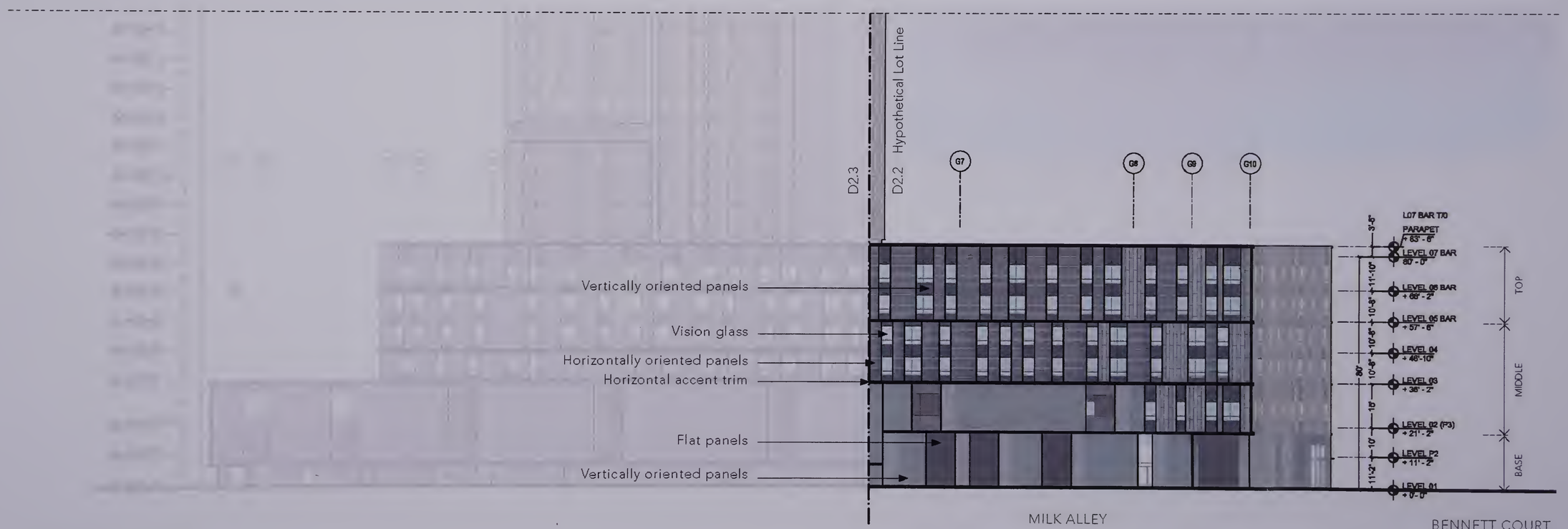
Union Square **Somerville, Massachusetts**

D2.1 East Building Elevation

49'-0"
33'-0"
55'-0"
Metal panel at roof screen
Metal panel at enclosed penthouse with integrated mechanical louvers
Vision glass
Spandrel glass
Horizontal metal banding
Vertically orientated cladding
Vertical metal accent
Mechanical louvers
Granite base
PROSPECT STREET
ALLEY
approx. 17'-0"
21'-6"
15'-6"
14'-6"
14'-6"
14'-6"
14'-6"
14'-6"
20'-0"
TOP
MIDDLE
BASE

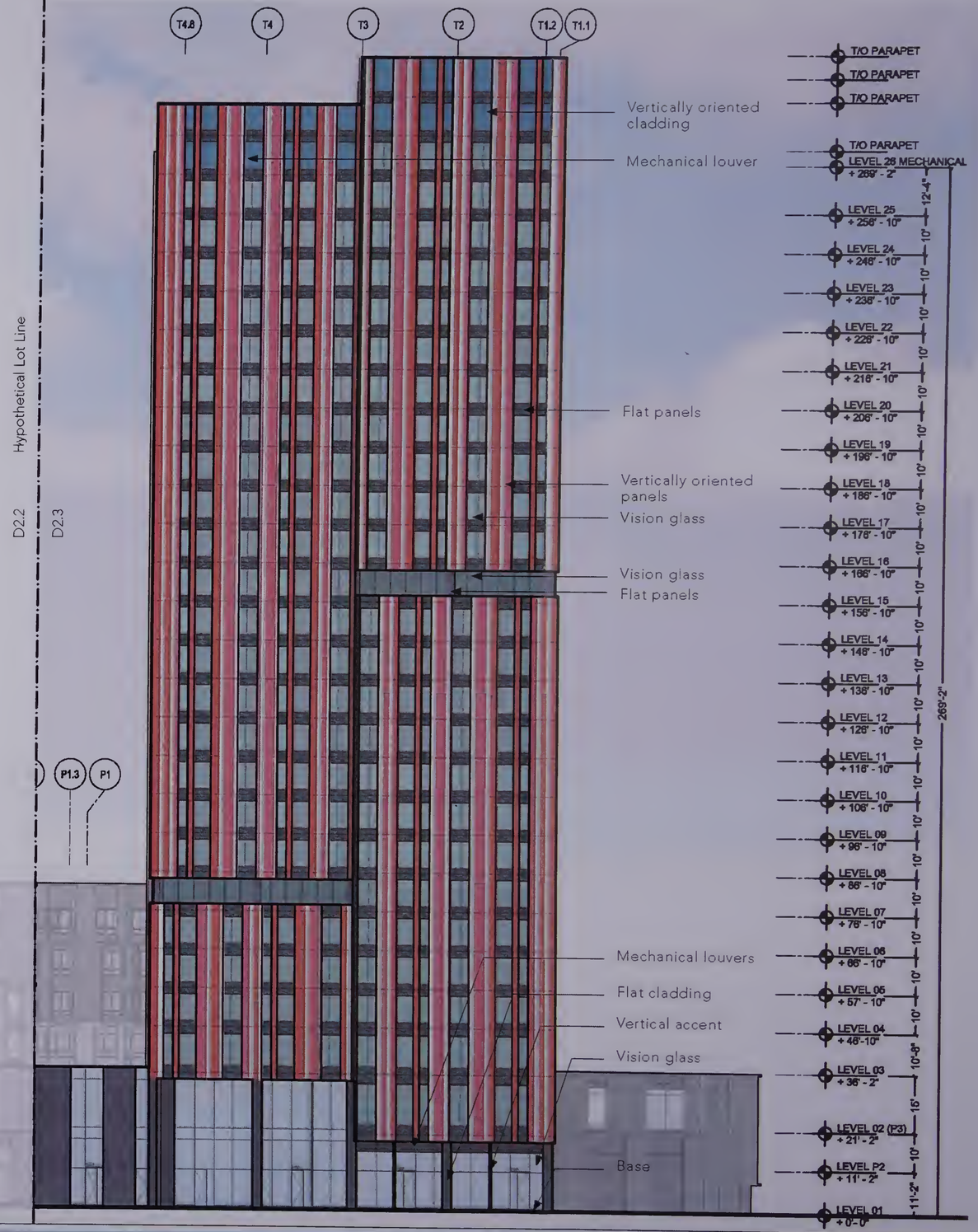
P8
P7
P6
P5
P4
P3
P2
D2.2
D2.3 Hypothetical Lot Li
L07 BAR T/O
PARAPET
+ 83' - 6"
LEVEL 07 BAR
80' - 0"
LEVEL 06 BAR
+ 68' - 2"
LEVEL 05 BAR
+ 57' - 6"
LEVEL 04
+ 46'-10"
LEVEL 03
+ 36' - 2"
LEVEL 02 (P3)
+ 21' - 2"
LEVEL P2
+ 11' - 2"
LEVEL 01
+ 0'-0"
3'-6"
11'-10"
10'-8"
10'-8"
10'-8"
15'
10'
11'-2"
80'
TOP
MIDDLE
BASE
Flat cladding
Vertical accent trim
Vision glass
Vertically oriented panels
Horizontal accent trim
Mechanical louvers
Vision glass
Vertically oriented panels
PROSPECT STREET
2 D2.2- WEST ELEVATION
1" = 30'-0"
LEVEL 12
+ 126' - 10"
LEVEL 11
+ 116' - 10"
LEVEL 10
+ 106' - 10"
LEVEL 09
+ 96' - 10"
LEVEL 08
+ 86' - 10"
LEVEL 07
+ 76' - 10"
LEVEL 06
+ 66' - 10"
LEVEL 05
+ 57' - 10"
LEVEL 04
+ 46'-10"
LEVEL 03
+ 36' - 2"
LEVEL 02 (P3)
+ 21' - 2"
LEVEL P2
+ 11' - 2"
LEVEL 01
+ 0'-0"
10'
10'
10'
10'
10'
10'
10'
10'-8"
15'
10'
11'-2"
268'
BA
GE
GF
GA
GG
GH
GI
Vision glass
Flat cladding
Horizontally oriented panels
L07 BAR T/O
PARAPET
+ 83' - 6"
LEVEL 07 BAR
80' - 0"
LEVEL 06 BAR
+ 68' - 2"
LEVEL 05 BAR
+ 57' - 6"
LEVEL 04
+ 46'-10"
LEVEL 03
+ 36' - 2"
LEVEL 02 (P3)
+ 21' - 2"
LEVEL P2
+ 11' - 2"
LEVEL 01
+ 0'-0"
3'-6"
11'-10"
10'-8"
10'-8"
10'-8"
15'
10'
11'-2"
80'
CHARLESTOWN PLACE
MILK ALLEY
1 D2.2- SOUTH ELEVATION
1" = 30'-0"

2 D2.2- NORTH ELEVATION
1" = 30'-0"



1 D2.2- EAST ELEVATION
1" = 30'-0"

1 D2.3- WEST ELEVATION
1" = 30'-0"


T4.B
T4
T3
T2
T1.2
T1.1
Hypothetical Lot Line
D2.2
D2.3
P1.3
P1
Vertically oriented cladding
Mechanical louver
Flat panels
Vertically oriented panels
Vision glass
Vision glass
Flat panels
Mechanical louvers
Flat cladding
Vertical accent
Vision glass
Base
T/O PARAPET
T/O PARAPET
T/O PARAPET
T/O PARAPET
LEVEL 26 MECHANICAL + 269' - 2"
LEVEL 25 + 256' - 10"
LEVEL 24 + 246' - 10"
LEVEL 23 + 236' - 10"
LEVEL 22 + 226' - 10"
LEVEL 21 + 216' - 10"
LEVEL 20 + 206' - 10"
LEVEL 19 + 196' - 10"
LEVEL 18 + 186' - 10"
LEVEL 17 + 176' - 10"
LEVEL 16 + 166' - 10"
LEVEL 15 + 156' - 10"
LEVEL 14 + 146' - 10"
LEVEL 13 + 136' - 10"
LEVEL 12 + 126' - 10"
LEVEL 11 + 116' - 10"
LEVEL 10 + 106' - 10"
LEVEL 09 + 96' - 10"
LEVEL 08 + 86' - 10"
LEVEL 07 + 76' - 10"
LEVEL 06 + 66' - 10"
LEVEL 05 + 57' - 10"
LEVEL 04 + 46'-10"
LEVEL 03 + 36' - 2"
LEVEL 02 (P3) + 21' - 2"
LEVEL P2 + 11' - 2"
LEVEL 01 + 0' - 0"
12'-4"
10'
10'
10'

1 D2.3- SOUTH ELEVATION
1" = 30'-0"
TA
TA.1
TA.3
TB
TC
TC.2
TC.5
TD
TE
TF
TF.3
T/O PARAPET
T/O PARAPET
T/O PARAPET
T/O PARAPET
LEVEL 26 MECHANICAL
+ 269' - 2"
LEVEL 25
+ 256' - 10"
LEVEL 24
+ 246' - 10"
LEVEL 23
+ 236' - 10"
LEVEL 22
+ 226' - 10"
LEVEL 21
+ 216' - 10"
LEVEL 20
+ 206' - 10"
LEVEL 19
+ 196' - 10"
LEVEL 18
+ 186' - 10"
LEVEL 17
+ 176' - 10"
LEVEL 16
+ 166' - 10"
LEVEL 15
+ 156' - 10"
LEVEL 14
+ 146' - 10"
LEVEL 13
+ 136' - 10"
LEVEL 12
+ 126' - 10"
LEVEL 11
+ 116' - 10"
LEVEL 10
+ 106' - 10"
LEVEL 09
+ 96' - 10"
LEVEL 08
+ 86' - 10"
LEVEL 07
+ 76' - 10"
LEVEL 06
+ 66' - 10"
LEVEL 05
+ 57' - 10"
LEVEL 04
+ 46'-10"
LEVEL 03
+ 36' - 2"
LEVEL 02 (P3)
+ 21' - 2"
LEVEL P2
+ 11' - 2"
LEVEL 01
+ 0' - 0"
12'-4"
10'
10'-8"
15'
11'-2"
269'-2"
Mechanical louver
Vertically oriented cladding
Vertically oriented panels
Flat panels
Vision glass
Mechanical louvers
Vision glass
Flat cladding
Vertically oriented panels
BA
GE
GF
GA
GG
GH
GI
L07 BAR T/O
PARAPET
+ 83' - 6"
LEVEL 07 BAR
80' - 0"
LEVEL 06 BAR
+ 68' - 2"
LEVEL 05 BAR
+ 57' - 6"
LEVEL 04
+ 46'-10"
LEVEL 03
+ 36' - 2"
LEVEL 02 (P3)
+ 21' - 2"
LEVEL P2
+ 11' - 2"
LEVEL 01
+ 0' - 0"
3'-6"
11'-10"
10'-3"
10'-8"
80'
Vision glass
Flat cladding
Horizontally oriented panels
Vision glass
Flat panels

T/O PARAPET
T/O PARAPET
T/O PARAPET
T/O PARAPET
LEVEL 26 MECHANICAL
+ 269' - 2"
LEVEL 25
+ 256' - 10"
LEVEL 24
+ 246' - 10"
LEVEL 23
+ 236' - 10"
LEVEL 22
+ 226' - 10"
LEVEL 21
+ 216' - 10"
LEVEL 20
+ 206' - 10"
LEVEL 19
+ 196' - 10"
LEVEL 18
+ 186' - 10"
LEVEL 17
+ 176' - 10"
LEVEL 16
+ 166' - 10"
LEVEL 15
+ 156' - 10"
LEVEL 14
+ 146' - 10"
LEVEL 13
+ 136' - 10"
LEVEL 12
+ 126' - 10"
LEVEL 11
+ 116' - 10"
LEVEL 10
+ 106' - 10"
LEVEL 09
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+ 66' - 10"
LEVEL 05
+ 57' - 10"
LEVEL 04
+ 46'-10"
LEVEL 03
+ 36' - 2"
LEVEL 02 (P3)
+ 21' - 2"
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+ 11' - 2"
LEVEL 01
+ 0' - 0"
12'-4"
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10'-8"
11'-2"
269'-2"
G1
G1.3
G2
G2.2
G3
G7

Phasing Table

1 D2.3- NORTH ELEVATION
1" = 30'-0"

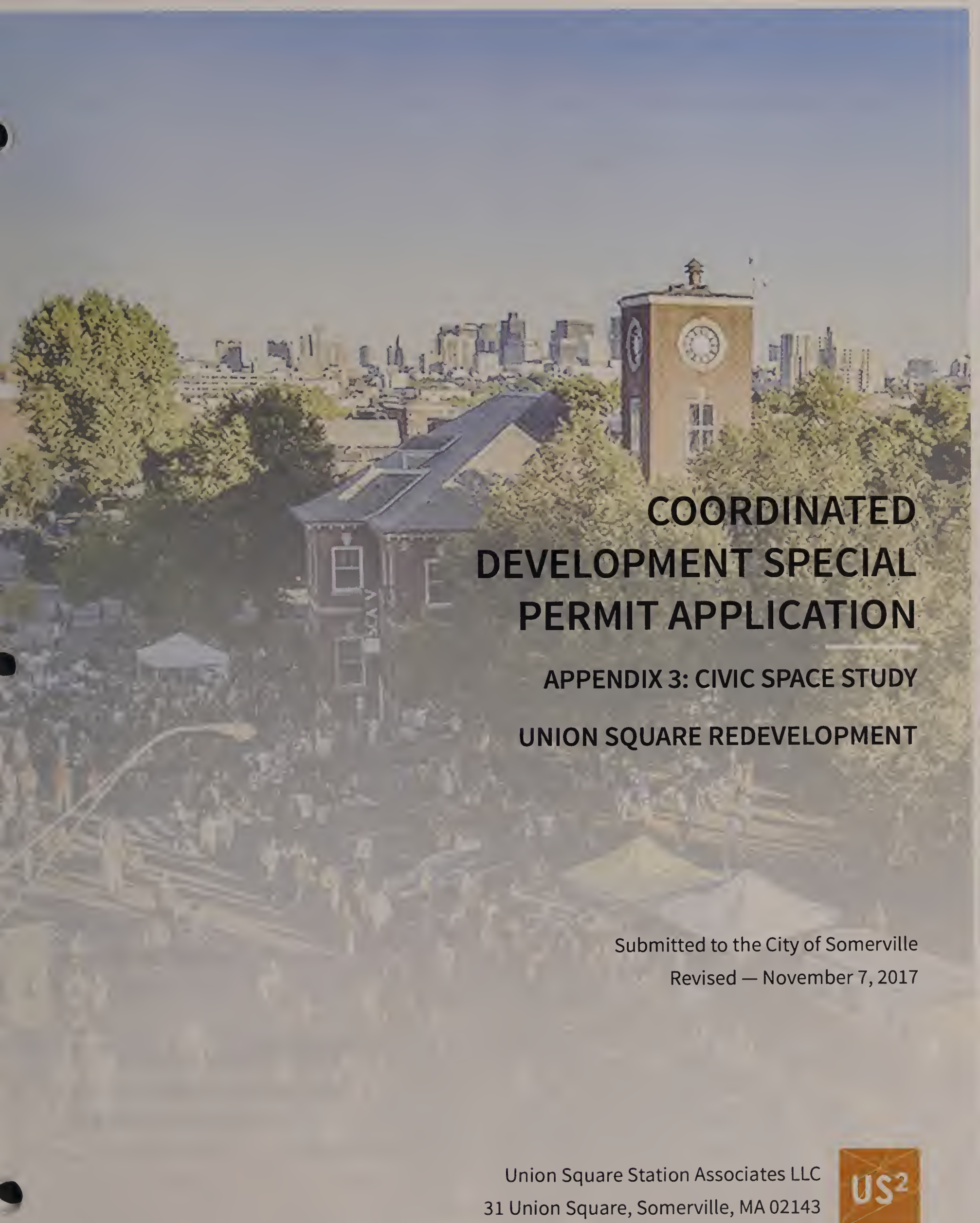
Union Square Somerville, Massachusetts

FEIR - ADDITIONAL PROJECT PHASE INFORMATION

	PROJECT TOTALS	PHASE ONE			PHASE TWO			PHASE THREE - SOUTH						PHASE THREE - NORTH								
		D2.1	D2.2/D2.3	Sub-Totals	D1.1	D3.1	Sub-totals	D3.2	D3.3	D4.1	D4.2	D4.3	Sub-totals	D1.2	D2.4	D5.2	D5.3	D6.1	D6.2	D7.1	D7.2	Sub-total
Building Program																						
Total (excluding parking)	**2,361,000**	178,000	429,000	**607,000**	104,000	280,000	**384,000**	351,000	257,000	30,000	-	61,000	**699,000**	248,000	12,000	25,000	33,000	112,000	115,000	45,000	81,000	**671,000**
Office/Lab (SF)	**1,158,000**	166,000	-	**166,000**	-	271,000	**271,000**	-	251,000	25,000	-	-	**276,000**	231,000	-	21,000	-	96,000	97,000	-	-	**445,000**
Arts and Creative Enterprise (SF)	**54,000**	-	13,000	**13,000**	-	-	-	9,000	6,000	-	-	-	**15,000**	6,000	12,000	-	-	4,000	4,000	-	-	**26,000**
Retail (SF)	**123,000**	12,000	17,000	**29,000**	11,000	9,000	**20,000**	9,000	-	5,000	-	7,000	**21,000**	11,000	-	4,000	3,000	12,000	14,000	5,000	4,000	**53,000**
Hotel (SF)	**93,000**	-	-	**-**	93,000	-	**93,000**		-	-	-	-	**-**	-	-	-	-	-	-	-	-	**-**
Residential (SF)	**933,000**	-	399,000	**399,000**	-	-	-	333,000	-	-	-	54,000	**387,000**	-	-	-	30,000	-	-	40,000	77,000	**147,000**
Parking Spaces	**1,495**		270	**270**	50	270	**320**		320			25	**345**	385			15	55	55	20	30	**560**
Environmental Impacts																						
Vehicle Trips (Adjusted)	**9,398**	870	1,165	**2,035**	790	1,253	**2,043**	883	1,052	181	-	201	**2,317**	1,146	49	149	95	600	636	143	185	**3,003**
Water Usage (gpd)	**140,485**	6,525	38,038	**44,563**	9,900	10,388	**20,288**	31,583	9,638	1,063	-	4,135	**46,419**	9,163	450	888	2,138	4,050	4,138	2,930	5,463	**29,220**
Wasterwater Generation (gpd)	**140,485**	6,525	38,038	**44,563**	9,900	10,388	**20,288**	31,583	9,638	1,063	-	4,135	**46,419**	9,163	450	888	2,138	4,050	4,138	2,930	5,463	**29,220**
Mitigation & Public Benefits																						
Jobs Creation & Workforce Development																						
Construction Jobs	**4,272**	330	753	**1,083**	184	617	**801**	552	483	46	-	101	**1,182**	492	19	40	57	214	179	73	132	**1,206**
Permanent Jobs	**5,186**	401	99	**500**	98	634	**732**	63	1,287	133	-	14	**1,497**	1,210	62	114	6	520	529	9	7	**2,458**
Arts & Creative Spaces (SF)	**54,000**	8,000	5,000	**13,000**			-	9,000	6,000				**15,000**	6,000	12,000			4,000	4,000			**26,000**
Job Linkage ($)	**2,821,636**	227,965	-	**227,965**	220,583	651,883	**872,466**	7,840	596,240	35,473	-	-	**639,553**	574,718	-	25,682	-	236,947	244,305	-	-	**1,081,652**
Housing																						
Housing Units	**998**		450	**450**			**-**	376				48	**424**				25			34	65	**124**
Affordable Units (20% of total)	**200**		90	**90**			**-**	75				10	**85**				5			7	13	**25**
Housing Linkage ($)	**10,843,050**	1,478,320	1,820	**1,480,140**	746,680	2,499,930	**3,246,610**	-	2,273,740	-	-	-	**2,273,740**	2,186,250	-	-	-	813,200	843,110	-	-	**3,842,560**
City Fiscal Benefits																						
Linkage ($) (as itemized above)	**13,664,686**	1,706,285	1,820	**1,708,105**	967,263	3,151,813	**4,119,076**	7,840	2,869,980	35,473	-	-	**2,913,293**	2,760,968	-	25,682	-	1,050,147	1,087,415	-	-	**4,924,212**
Permits & Fees ($)	**17,816,850**	1,375,986	3,142,346	**4,518,332**	766,970	2,572,079	**3,339,049**	2,305,806	2,011,681	192,303	-	422,449	**4,932,240**	2,049,335	80,286	166,310	236,257	890,398	747,067	306,475	551,101	**5,027,229**
SRA Land Cost Recovery ($)	**22,000,000**			**22,000,000**			**-**															**-**
Sub-total 'one time' City Fiscal Benefits ($)	*53,481,537*	*3,082,271*	*3,144,166*	*28,226,437*	*1,734,234*	*5,723,892*	*7,458,126*	*2,313,646*	*4,881,661*	*227,776*	-	*422,449*	*7,845,533*	*4,810,302*	*80,286*	*191,992*	*236,257*	*1,940,545*	*1,834,482*	*306,475*	*551,101*	*9,951,441*
Annual Taxes ($/year)	**11,141,879**	992,819	1,394,205	**2,387,025**	1,040,021	1,558,266	**2,598,287**	1,123,200	1,428,297	165,648	-	172,289	**2,889,434**	1,385,328	68,259	143,332	87,295	623,985	641,452	119,324	198,158	**3,267,133**
Commercial Taxes ($)	**8,440,812**	992,819	176,289	**1,169,109**	1,040,021	1,558,266	**2,598,287**	105,564	1,428,297	165,648	-	42,378	**1,741,887**	1,385,328	68,259	143,332	19,633	623,985	641,452	27,304	22,236	**2,931,529**
Transportation & Mobility																						
Neighborhood Mobility Management																						
GLX Contribution to City ($)[4]	**5,836,392**	440,016	1,060,488	**1,500,504**	257,088	692,160	**949,248**	867,672	635,304	74,160	-	150,792	**1,727,928**	613,056	29,664	61,800	81,576	276,864	284,280	111,240	200,232	**1,658,712**
Offsite Infrastructure Contribution, includes planned Complete Streets improvements ($)[1,4]	**4,627,560**	348,880	840,840	**1,189,720**	203,840	548,800	**752,640**	687,960	503,720	58,800	-	119,560	**1,370,040**	486,080	23,520	49,000	64,680	219,520	225,400	88,200	158,760	**1,315,160**
Transportation Mitigation Funds from Future Phase Mitigation Contribution[2,4]	*o portion of or all of Future Phase Mitigation Contribution below (at City discretion, see Other Benefits below for Future Phase Constribution amount)*										-	-	**-**	-	-	-	-	-	-	-	-	**-**
Rapid Response Transportation Mitigation Funds ($)[3,4]	**411,500**	17,800	42,900	**60,700**	20,800	56,000	**76,800**	70,200	51,400	6,000	-	12,200	**139,800**	49,600	2,400	5,000	6,600	22,400	23,000	9,000	16,200	**134,200**
Sub-total transportation & mobility contributions ($)	**10,875,452**	806,696	1,944,228	**2,750,924**	481,728	1,296,960	**1,778,688**	1,625,832	1,190,424	138,960	-	282,552	**3,237,768**	1,148,736	55,584	115,800	152,856	518,784	532,680	208,440	375,192	**3,108,072**
Transportation Demand Management & Reporting	**17**	1	1	**2**	1	1	**2**	1	1	1	1	1	**5**	1	1	1	1	1	1	1	1	**8**
Shared Parking Construction & Management (spaces)	**1,405**		270	**270**	50	270	**320**		320				**320**	385				55	55			**495**
Hotel Shuttle	**1**			**-**	1		**1**						**-**									**-**
Mid-Block Thoroughfares (LF)	**1,885**	375	750	**1,125**	225	170	**395**	183	183				**365**									**-**
Transit Riders																						
Improved Bus Stops on Project Frontages (#)	*6*	1	-	**1**		1	**1**					1	**1**	1					1		1	**3**
Permanent Easement for MBTA Station (SF)	**16,288**		16,288	**16,288**			**-**						**-**									**-**
ADA Path MBTA to Prospect St. Sidewalk (LF)	**350**		350	**350**			**-**						**-**									**-**
D2 Improvements for MBTA Station and Access ($)	**1,500,000**		1,500,000	**1,500,000**			**-**						**-**									**-**
Pedestrians																						
Expanded Sidewalks on 'Pedestrian Streets' (LF)	**2,541**	350	-	**350**	560	-	**560**	-	-	180	-	290	**470**	404	-	95	145	200	230	45	42	**1,161**
Cyclists																						
Short term & Long term Bike Parking	**1,603**	60	503	**563**	32	72	**104**	422	99	12	-	57	**590**	97	5	10	29	45	46	40	74	**346**
MBTA Bicycle Parking	**120**		120	**120**			**-**						**-**									**-**
Bike Share Stations & Bikes	**2**			**-**	1	-	**1**				1		**1**									**-**
Utility Infrastructure																						
Offsite Infrastructure Contribution - includes Utilities ($)[1,4]	*o portion of Offsite Infrostructure Contribution noted above in Transportation will contribute to planned utility improvements*																					
I/I Contribution ($)	**4,472,081**	187,167	1,172,077	**1,359,245**	384,848	384,282	**769,130**	906,552	276,999	29,970	-	118,675	**1,332,195**	263,612	13,238	25,849	61,521	201,489	153,865	83,739	208,199	**1,011,512**
Sub-total utility contributions ($)	*4,472,081*	*187,167*	*1,172,077*	*1,359,245*	*384,848*	*384,282*	*769,130*	*906,552*	*276,999*	*29,970*	-	*118,675*	*1,332,195*	*263,612*	*13,238*	*25,849*	*61,521*	*201,489*	*153,865*	*83,739*	*208,199*	*1,011,512*
Private Investment Unlocking $16M MassWorks Grant ($)	**325,000,000**	150,000,000	175,000,000	**325,000,000**			**-**															
Sustainable Design & Climate Change Preparedness																						
Open Space & Public Realm																						
Civic Open Space (SF)	**113,600**	-	20,100	**20,100**	-	16,000	**16,000**	8,200	3,700	3,400	6,000	6,500	**27,800**	27,000	7,100		-		9,100		6,500	**49,700**
Pervious Civic Open Space (minimum SF)	**79,520**	-	14,070	**14,070**	-	11,200	**11,200**	5,740	2,590	2,380	4,200	4,550	**19,460**	18,900	4,970	-	-	-	6,370	-	4,550	**34,790**
Buildings																						
LEED Gold Certifiable Building Area (SF)	**2,216,000**	178,000	429,000	**607,000**	104,000	280,000	**384,000**	351,000	257,000	-	-	61,000	**669,000**	248,000	-	-	-	112,000	115,000	-	81,000	**556,000**
LEED Silver Certifiable Building Area (SF)	**145,000**	-	-	**-**	-	-	**-**	-	-	30,000	-	-	**30,000**	-	12,000	25,000	33,000	-	-	45,000	-	**115,000**
Passive House Multi-Family Building (SF)	**54,000**			**-**			**-**					54,000	**54,000**									**-**
PV - Set Aside on Roof (SF)	**40,000**	-	10,200	**10,200**	6,700	-	**6,700**	-	-	2,800	-	6,800	**9,600**	-	-	2,000	-	-	-	4,100	7,400	**13,500**
PV - Potential Additional Set Aside on Roof (SF)	**49,100**	-	-	**-**	-	14,800	**14,800**	-	17,700	-	-	-	**17,700**	16,600	-	-	-	-	-	-	-	**16,600**
Green Vehicle Infrastructure																						
Parking Spaces with EV Charging	**38**		10	**10**	2	8	**10**		6			-	**6**	8				2	2		-	**12**
Parking Spaces to be EV-Ready	**38**	-	10	**10**	2	8	**10**		6			-	**6**	8				2	2		-	**12**
Parking Spaces reserved for LEV/FEV Vehicles	**72**	-	14	**14**	3	14	**17**		16			-	**16**	19				3	3		-	**25**
Parking Spaces Reserved for Carshare	**14**	-	2	**2**	2	2	**4**	-	2	-	-	-	**2**	2	-	-	-	2	2	-	-	**6**
Parking Space Reserved for Carpool per zoning	**29**	-	5	**5**	3	5	**8**	-	5	-	-	-	**5**	5	-	-	-	3	3	-	-	**11**
Total Green Spaces	**191**	-	41	**41**	12	37	**49**	-	35	-	-	-	**35**	42	-	-	-	12	12	-	-	**66**
Other Benefits																						
Community Benefits Contribution ($)[4]	**3,890,928**	293,344	706,992	**1,000,336**	171,392	461,440	**632,832**	578,448	423,536	49,440	-	100,528	**1,151,952**	408,704	19,776	41,200	54,384	184,576	189,520	74,160	133,488	**1,105,808**
Future Phase Mitigation Contribution, including Transportation Mitigation ($)[4]	**3,437,840**			**-**	203,840	548,800	**752,640**	687,960	503,720	58,800	-	119,560	**1,370,040**	486,080	23,520	49,000	64,680	219,520	225,400	88,200	158,760	**1,315,160**
Sub-total other public benefits contributions ($)	*7,328,768*	*293,344*	*706,992*	*1,000,336*	*375,232*	*1,010,240*	*1,385,472*	*1,266,408*	*927,256*	*108,240*	-	*220,088*	*2,521,992*	*894,784*	*43,296*	*90,200*	*119,064*	*404,096*	*414,920*	*162,360*	*292,248*	*2,420,968*

1. The Offsite Infrastructure Contribution will be utilized by the City to fund planned infrastructure improvements with the neighborhood that will include both Complete Streets and Utilities. The total value of this contribution is shown under transportation and referenced under utilities so it is not double counted.
2. The Future Phase Mitigation Contribution will be utilized at the City's discretion to address future transit, transportation infrastructure or community needs. The City anticipates using a portion or all of these funds for future transportation mitigation. The total value of this contribution is shown under other benefits and referenced under transportation so it is not double counted.
3. The Rapid Response Transportation Mitigation Fund is $0.10 psf of the future phase contribution and $0.10 psf of the offsite infrastructure contribution as designated by the City.
4. These mitigation contributions will be paid in accordance with the Development Covenant by and between U52 and the City of Somerville. 50% of the contribution amount is payable at the issuance of the building permit for the given Lot and 50% is payable at certificate of occupancy for the given Lot. In addition, the required contribution amount escalates at the Consumer Price Index on an annual basis.

Civic Space Study



COORDINATED DEVELOPMENT SPECIAL PERMIT APPLICATION

APPENDIX 3: CIVIC SPACE STUDY

UNION SQUARE REDEVELOPMENT

Submitted to the City of Somerville

Revised — November 7, 2017

Union Square Station Associates LLC

31 Union Square, Somerville, MA 02143

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EXECUTIVE SUMMARY

CIVIC SPACE STUDY OVERVIEW

As part of the CDP planning process, the city required the preparation of this Civic Space Study (CSS) in order to assess existing conditions and needs for civic space in Union Square. The intent of the analysis is to generate data on existing landscape amenities, the people who use civic spaces in the Union Square neighborhood and anticipate future needs as well as any local or city-wide civic space needs. The study acknowledges that the information is taken as a snapshot in time and is mindful of the evolution of conditions and the multitude of perspectives that need to be considered. With this in mind, the background provided by the CSS helped to inform the civic space plans for the revitalization of Union Square. During the Coordinated Development Plan process, the locations and sizes of particular civic spaces will be defined and at the Design and Site Plan Review stage, the public process will include a discussion of the design, program and character of each individual civic space proposed within the development.

The CSS focused on a defined area, identified by extending a ½ mile radius from each of the D Blocks (approximately a 10 minute walk). Existing conditions were assessed to provide important context for the plan and to identify areas of opportunity. The assessment contains an inventory of existing civic spaces, a walkshed analysis for each space type, as well as a review of the local demographics and

FIGURE 3.1: UNION SQUARE CIVIC SPACE STUDY AREA

environmental justice populations to help identify who the spaces served. The needs assessment portion of the study cataloged open space goals from other city processes, gained open space perspective via city department interviews, summarized the open space feedback from the CDP neighborhood meetings and outlined the findings from the existing conditions assessment. This work was then distilled into a series of conclusions that directly informed the CDP civic space approach that is outlined in the Civic Space section of the application.

The existing conditions review inventoried 34 acres of existing open space within the study area comprised of 78.5% parks, 19.8% commons and 1.7% plazas. Closer inspection of the existing conditions noted that a majority of the existing spaces, 70% of locations and 62% of the area are located to the north and west of the D Blocks. Walkshed analyses were also performed on the six civic space types that were present in the study area. This analysis revealed that a majority of residents and workers in the study area can reasonably walk to one or more civic spaces and reinforced that the north central portion of the study area is best served by existing spaces. Walkshed analysis also identified D1, D2 and D4 as blocks that could fill neighborhood civic space gaps or provide higher levels of service.

In order to review another aspect of accessibility, Environmental Justice populations were examined within the study area based on 2010 Census data and the criteria provided by the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA). The EOEEA identifies criteria for vulnerable populations related to low income, minorities or English language isolation and seeks to promote the equitable distribution of environmental benefits. All of the D Blocks, with the exception of D7, fall within the environmental justice population areas and the findings indicate that the populations that meet more than one of the three environmental justice populations are primarily located east of the D Blocks.

The needs assessment also considered the civic space needs of both existing and new populations of workers and residents as their use patterns will evolve with the neighborhood. With the introduction of the Green Line as a catalyst for growth, 5,000 new workers and 1,000 new homes will influence new centers of activity and planned civic spaces should anticipate and respond to that future. Moreover, a

FIGURE 3.2: UNION SQUARE WALKSHED AND ENVIRONMENTAL JUSTICE MAPS

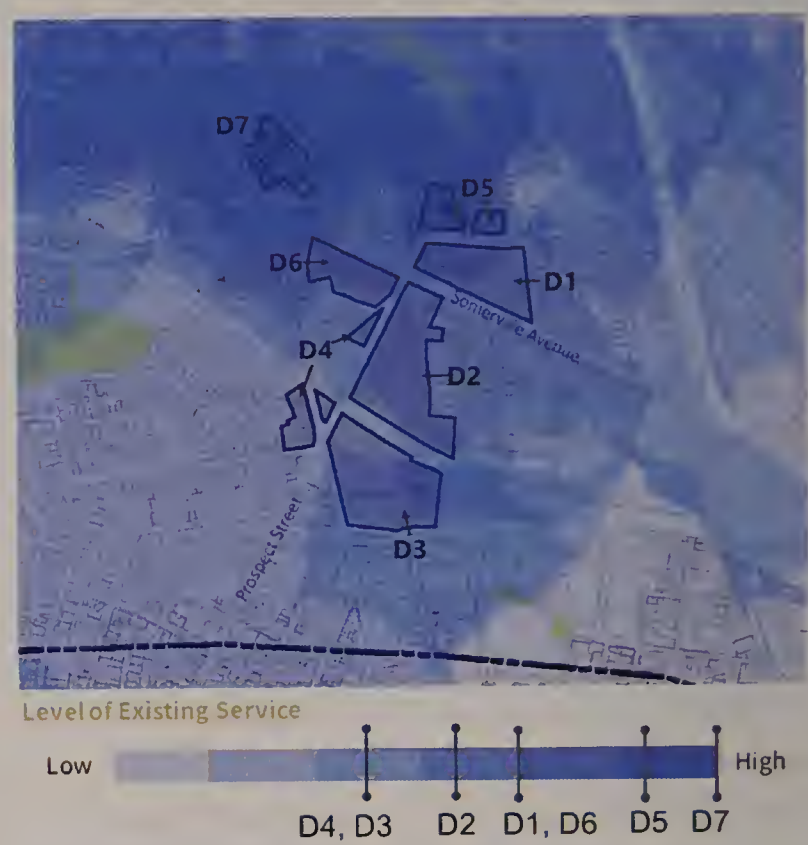

FIGURE 3.3: PRESENT AND FUTURE CONDITIONS

GLX is a catalyst for growth and D Block revitalization. 5,000 new workers, 1,000 new homes.

- Large Employer
- Residential > 6 Units
- Schools
- Existing affordable housing
- Proposed market-rate and affordable housing

demographics review highlighted the need for spaces to serve a variety of ages and users, identifying opportunities to serve the needs of the largest population (ages 25-34) as well as a growing elderly population.

City department representatives from Parks and Recreation, Sustainability and Environment, Parks and Open Space were interviewed to get their feedback about the open space needs and priorities for the community. These conversations elevated the importance of considering open space's role in mitigating vulnerability to climate change, especially related to urban heat island impacts and flood risk. Interviewees also cited the need for more open spaces and more multi-use open spaces throughout the city to serve a variety of users and uses. One use, the need for more athletic fields, was particularly identified as a pressing need. This resulted in an acknowledgment that the D Blocks can meet many civic space needs but are unable to respond to the need for athletic fields given their locations, their shape and the other economic development goals for the properties.

Community input was also important to understanding community needs and preferences and how they can guide the civic space planning. To that end, the following relevant community-driven planning processes and resulting reports were reviewed to understand the open space goals included therein: SomerVision, Union Square Neighborhood Plan, the Open Space and Recreation Plan and the Union Square Zoning. The detailed results of this review are included in the CSS and the highlights of the open space goals include: creating multi-functional and multi-user spaces; supporting urban agriculture and community gardening; including sustainable features; focusing on pedestrian connectivity and experience; incorporating the arts and creativity; considering the needs of senior citizens; and ensuring that community input informs the civic space planning process.

In addition, US2 hosted two neighborhood meetings for the CDP and the team received many comments about open space, some of which coalesced, while others expressed differing views from each other. The first meeting on September 5, 2017, included

over 140 community members and covered a wide array of project topics including open space. In general, there was a strong interest in open space and a fairly consistent desire for green planted spaces and "urban oasis" over hard spaces. There was also a lot of interest in sustainable measures and arts-directed spaces. The meeting also explored the connectivity of various spaces – both formal and informal.

Considerable discussion at the first meeting centered on the location of the neighborhood park. The original location suggested in the Neighborhood Plan was D4.3. At the request of community members during the zoning process, US2 considered D1 and D7 as alternative locations. Upon further analysis and consideration of a variety of factors, the D1 location emerged as the preferred location and was presented at the neighborhood meeting. D4.3 was only mentioned as a preference by one or two attendees; however, there was divided opinion as to whether D1.2 or D7.2 would be a better location for this neighborhood amenity.

Given the level of interest in the park location and at the encouragement of neighborhood residents, another meeting was hosted on October 18, 2017 to present the park alternatives analysis, provide additional detail about the proposed D1.2 location and discuss the ideas with community members.

The meeting was attended by over 50 people and the discussion was thoughtful and passionate. Several participants commented on the importance of adding new open space and doing it thoughtfully as well as ensuring that a broad group of residents could offer their input. During the discussion, there were divided views as to whether D1.2 or D7.2 was the best location. D7.2 advocates cited its solar orientation, location near existing neighborhood activity nodes and proximity to the senior housing building as clear advantages. Advocates of D1.2 highlighted its location in an underserved portion of the neighborhood, its location midway between the future MBTA stations and its proximity to affordable housing on Washington Street and Linden Street. More details about the open space discussion at each of the neighborhood meeting is provided later in this CSS, and full meeting details are provided in Appendix 2.

The observations and findings from the CSS informed the approach to the civic space study included herein. Some of the CSS's influences on the CDP civic space plan included herein are highlighted as follows:

- The civic space plan responds to the important and detailed civic space zoning requirements including overall civic space area requirements, the need for a 27,000 square foot Neighborhood Park and Plaza and the defined design standards for the nine permitted civic space types (area, seating, tree count, green space, previous area, etc.).
- In order to address the breadth of users and use needs as well as the evolving use patterns in the neighborhood, six of the seven D Blocks include a civic space and the two main spaces, the D2 plaza and the D1.2 neighborhood park are centrally located to serve a breadth of users.

- Connectivity and linkages between civic spaces were a significant driver of the open space plan.
- The D1.2 neighborhood park was sited in order to address an open space inequity on the eastern portion of the neighborhood uncovered during the existing space inventory.
- For the group of residents that supported a more significant open space (ideally the neighborhood park) on D7.2, a 6,000 square foot open space was added on D7.2 and pathways to Bow Street and to the senior and young/disabled housing have been included to respond to the community interests.
- To address the stated need for community gardens, the D4.3 Concord Community Garden is being preserved.
- The D3.2 open space was relocated from the Windsor Place frontage to the Webster Street frontage to provide a better buffer from the existing residential neighborhood as requested by community members.
- In response to the expressed desire for significant community involvement in the type and character of each space, the development team has opted to defer the designation of the civic space type for civic space parcels that have type flexibility until the site plan review stage. This will give opportunity for the community, as well as specific building and streetscape design, to drive the design and character of the space. In addition, based on community feedback, sustainable design features and incorporation of arts and performance opportunities will be important themes as individual spaces are designed and programmed.

Additional details about the CSS findings and their influence on the open and civic space plan can be found in the conclusion section at the end of the CSS.

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EXISTING CONDITIONS ANALYSIS

DEFINING THE CIVIC SPACE STUDY AREA

To better understand the surrounding context of the proposed Union Square revitalization development, the area within comfortable walking distances of the development was considered from various perspectives. The specific boundary of the study area was defined by extending a half mile radius (roughly equating to a 10 minute walk) from the center of each proposed development parcel and then tracing the outermost radii of all the parcels combined. Due to the proximity of Union Square to the Somerville city line, and the high likelihood that residents of one city would use the outdoor spaces of the other, the study area boundary extends into Cambridge. This boundary is used repetitively throughout the civic space analysis.

FIGURE 3.4: STUDY AREA DIAGRAM

STUDY AREA CIVIC SPACES

Captured in the accompanying image, are the 30 civic spaces that currently exist within the study area. These spaces were analyzed both as they relate to type and size in order to inform the opportunities that may exist to fulfill a unique need. The study is based on information collected by the Mayor's Office of Strategic Planning and Community Development and does not employ the exact same typologies for civic space as the Union Square Overlay zoning, however certain observations can still be made.

FIGURE 3.5: EXISTING CIVIC SPACE USE TYPES

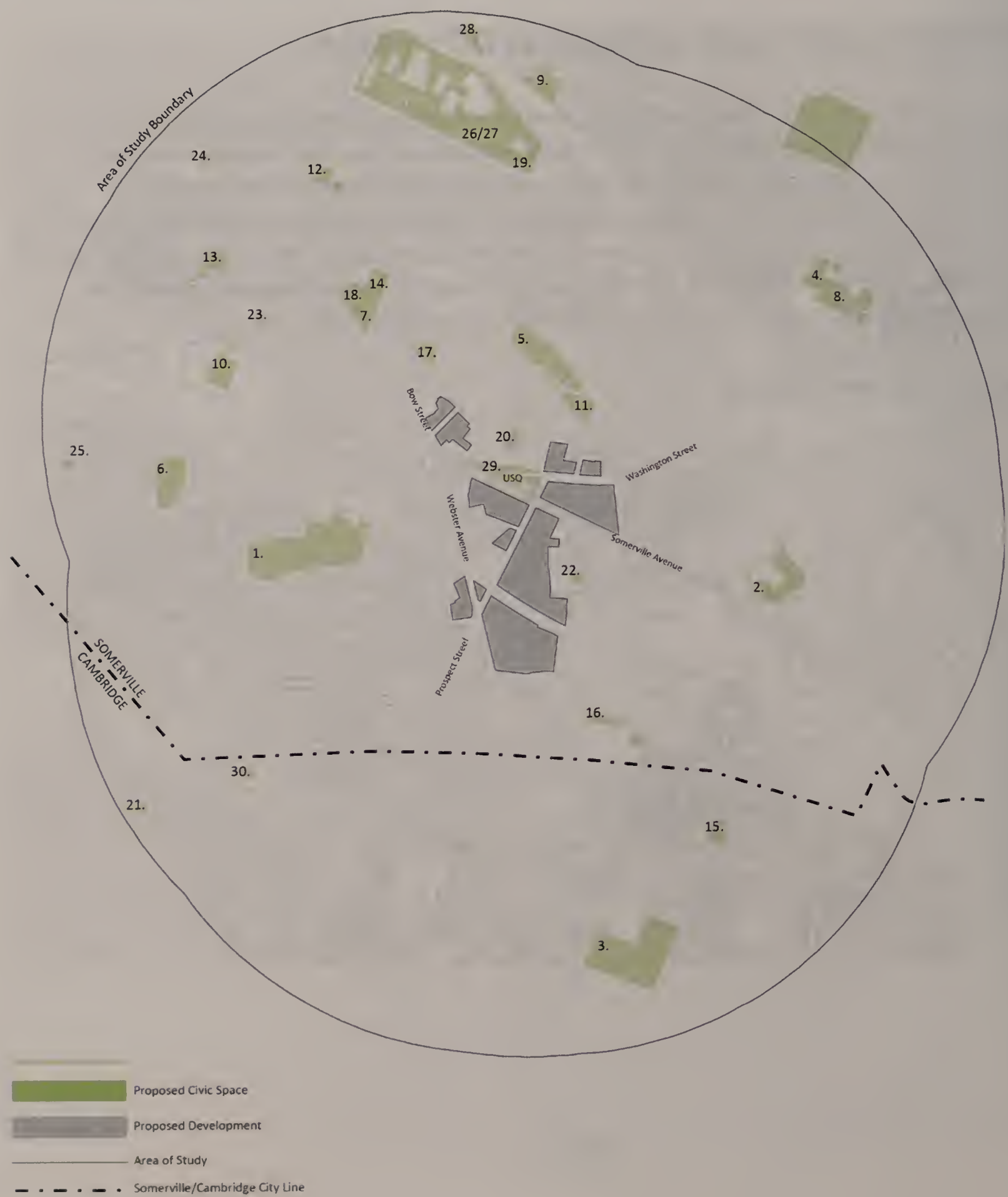


TABLE 3.1: EXISTING CIVIC SPACE EVALUATION

#	EXISTING LOCATION NAME	CITY	TYPE (USQ OVERLAY)	SF	Acres	% of Total	CIVIC USES (ZONING OVERHAUL)	
	PARKS			**1,163,136**	**26.70**	**78.47%**		
	Regional Parks			**-**	**0.00**	**0.00%**		
	N/A			-	0.00	0.00%		
	Community Parks			**335,412**	**7.70**	**22.63%**		
1	Lincoln Park	Somerville	n/a	243,936	5.60	16.46%	Athletic Fields	Playground
2	Art Farm	Somerville	Neighborhood Park	91,476	2.10	6.17%	Government/Public Service	Urban Agriculture
	Neighborhood Parks			**779,424**	**17.89**	**52.59%**		
3	Donnelly Field	Cambridge	Neighborhood Park	307,844	7.07	20.77%	Athletic Fields	
4	Glen Park/Capuano Playground	Somerville	Neighborhood Park	83,576	1.92	5.64%	Schoolyard	Playground
5	Prospect Hill Park	Somerville	Neighborhood Park	71,178	1.63	4.80%	Passive Space	Landmark
6	Perry Park	Somerville	Neighborhood Park	55,460	1.27	3.74%	Passive Space	
7	Nunziato Field	Somerville	Neighborhood Park	39,835	0.91	2.69%	Athletic Fields	
8	McCarthy/Capuano Field	Somerville	n/a	37,897	0.87	2.56%	Athletic Fields	
9	Edward Leathers Community Park	Somerville	Neighborhood Park	32,348	0.74	2.18%	Passive Space	Dog Park
10	Milk Row Cemetery	Somerville	Neighborhood Park	30,241	0.69	2.04%	Government/Public Service	Landmark
11	Senator Corbett McKenna Park	Somerville	Playground	27,016	0.62	1.82%	Playground	
12	Cummings Schoolyards (2 street frontages)	Somerville	Neighborhood Park	19,293	0.44	1.30%	Schoolyard	Playground
13	Osgood Park	Somerville	Neighborhood Park	17,337	0.40	1.17%	Playground	Urban Agriculture
14	Somerville Community Growing Center	Somerville	Community Garden	15,555	0.36	1.05%	Urban Agriculture	
15	Gannett Warren Pals Park	Cambridge	Neighborhood Park	14,577	0.33	0.98%	Playground	Passive Space
16	South Street Farm	Somerville	Community Garden	14,268	0.33	0.96%	Urban Agriculture	
17	Walnut Street Park	Somerville	Community Garden	12,999	0.30	0.88%	Playground	Urban Agriculture
	Pocket Parks			**48,300**	**1.11**	**3.26%**		
18	Nunziato Dog Park	Somerville	Dog Park	9,383	0.22	0.63%	Dog Park	
19	Central Hill Park Playground	Somerville	Playground	9,348	0.21	0.63%	Playground	
20	Stone Place Park	Somerville	Pocket Park	6,159	0.14	0.42%	Passive Space	
21	Duffett Tot Lot	Cambridge	Playground	5,340	0.12	0.36%	Playground	
22	Allen Street Community Garden	Somerville	Community Garden	5,130	0.12	0.35%	Urban Agriculture	
23	Quincy Street Park	Somerville	Pocket Park	5,098	0.12	0.34%	Passive Space	
24	Avon Community Garden	Somerville	Community Garden	4,229	0.10	0.29%	Urban Agriculture	
25	Palmacci Playground	Somerville	Playground	3,613	0.08	0.24%	Playground	
	COMMONS			**293,432**	**6.74**	**19.80%**		
	Public Common			**277,778**	**6.38**	**18.74%**		
26	Central Hill Park	Somerville	n/a	229,311	5.26	15.47%	Passive Space	
27	Central Hill Park, Library	Somerville	n/a	48,467	1.11	3.27%	Passive Space	
	Public Square			**-**	**0.00**	**0.00%**		
	N/A			-	0.00	0.00%		
	Green			**15,654**	**0.36**	**1.06%**		
28	Pearl Street Park (Gilman Square)	Somerville	Green	15,654	0.36	1.06%	Passive Space	
	PLAZAS			**25,636**	**0.59**	**1.73%**		
	Central Plaza			**25,636**	**0.59**	**1.73%**		
29	Union Square Plaza	Somerville	Plaza	16,302	0.37	1.10%	Passive Space	Café Area
30	Mayer Alfred E. Vellucci Community Plaza	Cambridge	Plaza	9,334	0.21	0.63%	Passive Space	
	Through Block Plaza			**-**	**0.00**	**0.00%**		
	N/A			-	0.00	0.00%		
	Pocket Plaza			**-**	**0.00**	**0.00%**		
	N/A			-	0.00	0.00%		
	TOTAL CIVIC SPACE			**1,482,204**	**34.03**	**100.00%**		

In general the vast majority of the existing civic spaces within a 10 minute walk of the development are parks of some type (78% are parks including 23% community parks, 53% neighborhood parks, 3% pocket parks). The parks range widely in size from 3,600 SF to 307,800 SF. The largest park, Donnelly Field, is actually in Cambridge, followed by Lincoln Park at 243,900 SF. The other parks include Art Farm, Glen Park, Prospect Hill Park, Perry Park, Nunziato Field, McCarthy Field, Edward Leathers Community Park, Milk Row Cemetery, Senator Corbett McKenna Park, Cummings Schoolyards, Osgood Park, Somerville Community Growing Center, Gannett Warren Pals Park, South Street Farm , Walnut Street Park, Nunziato Dog Park, Central Hill Park Playground, Stone Place Park, Duffett Tot Lot, Allen Street Community Garden, Quincy Street Park, Avon Community Garden, Palmacci Playground.

The next largest civic space type, a commons, is also park-like, an example being the Central Hill Park by Somerville City Hall at 229,300 SF. 20% of the existing civic spaces are Commons (19% public common and 1% green). The other commons include Central Hill Park (Library) and Pearl Street Park. Plazas account for a very small percentage of the existing civic spaces, the most significant one being Union Square Plaza. Only 2% of the existing civic spaces are plazas, all of which are Central Plazas. The largest is Union Square Plaza at 16,300 SF. The other plaza is Mayer Alfred E. Vellucci Community Plaza in Cambridge.

It was also noted that the majority of the existing civic spaces are located to the Northwest side of the study area, leaving the Eastern side under-served.

The combination of these findings was provided by the City of Somerville and the City of Cambridge based on the civic space study area. The accompanying, Table 3.4 Existing Civic Space Evaluation, reflects this contribution and provides a resource for continued analysis.

CONTEXT - LANDSCAPE USE TYPES

Landscape use types further describe the existing civic spaces, some of which include multiple landscape use types. These use types identify activities such as athletic fields, school yards, government and public services, passive spaces, playgrounds, urban agriculture, dog parks, café space and landmarks. The use types were defined by the Mayor's Office of Strategic Planning and Community Development and are identified in Table 3.4. Information collected on use types can be used to understand types of uses that are currently provided, and identify those that may be lacking.

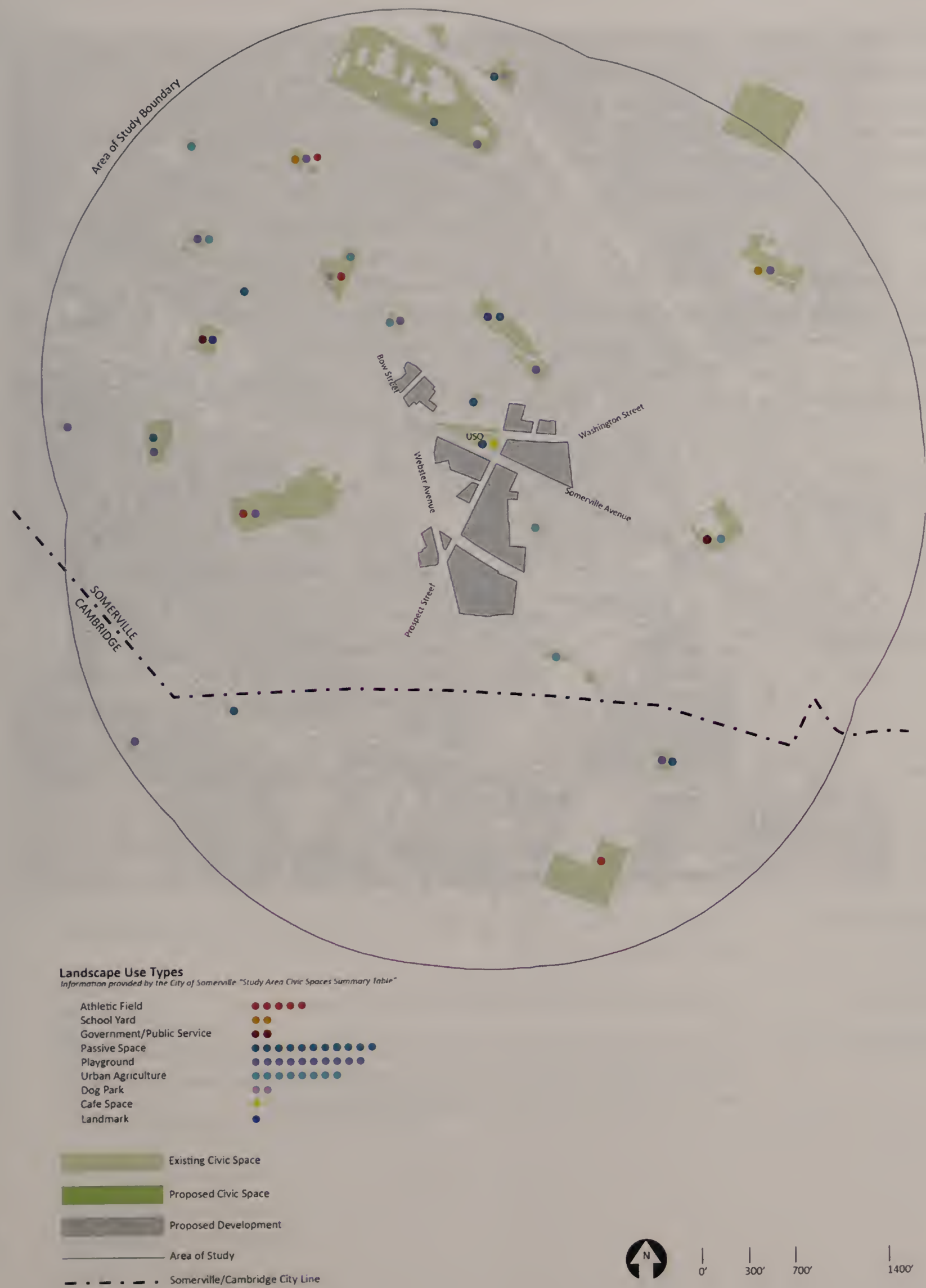
The most common landscape use types within the study area are passive spaces, playgrounds and urban agriculture, passive spaces being the most represented. Playgrounds are the second most common landscape use type: notably, a significant majority of homes within the study area are within a short walk to a playground. Reflecting a growing desire for community garden space, the third highest landscape use type is urban agriculture.

Passive Spaces are the most common landscape use type as 36% of existing civic spaces include passive space. The existing civic spaces that include passive space are Prospect Hill Park, Perry Park, Edward Leathers Community Park, Gannett Warren Pals Park, Stone Place Park, Quincy Street Park, Central Hill Park, Central Hill Park (Library), Union Square Plaza and Mayer Alfred E. Vellucci Community Plaza.

Playgrounds are the second most common landscape use type. 33% of existing civic spaces include playgrounds. The existing civic spaces that include playgrounds are Lincoln Park, Glen Park, Senator Corbett McKenna Park, Cummings Schoolyards, Osgood Park, Gannett Warren Pals Park, Walnut Street Park, Central Hill Park Playground, Duffett Tot Lot and Palmacci Playground.

The third highest landscape use type is urban agriculture. 26% of existing civic spaces include urban agriculture. The existing civic spaces with urban agriculture include Avon Community Garden, Allen Street Community Garden, Walnut Street Park, South Street Farm, Somerville Community Growing Center, Osgood Park, Glen Park and Art Farm.

FIGURE 3.6: LANDSCAPE USE TYPE



CONTEXT - EXISTING CONDITIONS

Existing building types and uses that might impact the needs of the civic space were identified to better understand the Union Square community. These include schools, religious institutions, daycares, affordable housing (> 6 units), multi-residential buildings (> 6 units), elderly housing and large employers.

Schools in the study boundary include Somerville High School located within the green space of the commons at Central Hill Park, Albert F. Algenziano School next to Lincoln Park, and other schools such as Prospect Hill Academy, Community Preschool, Ralph and Jenny Center and Violeta Montessori School. There are multiple religious institutions throughout the study area and a number of daycares that are generally located more to the periphery of the study area. Affordable and elderly housing buildings are also dispersed throughout the area, typically in smaller buildings. Currently the large employers, both private and public such as Somerville Hospital, are located away from the heart of the study area – a trend the Union Square revitalization intends to reverse.

TABLE 3.2: EXISTING USES

USE TYPE	EXAMPLES IN THE STUDY AREA
Schools	Somerville High School, Albert F. Argenziano School, Community Preschool, Ralph and Jenny Center, Violeta Montessori School
Religious Institutions	St. Joseph's Church, United Presbyterian Church, St. Anthony's Church, Boston Japanese Christian Church, Bethel Evangelical Church, Domitian of the Virgin Mary, Mission Church of Christ, Massachusetts Avenue Baptist, , The Faithful and True Witness Apostolic Church Ministries, Adventist Congregational Church
Daycares	Somerville YMCA, Tree House Academy Childcare, Bigelow Cooperative Daycare Center, Kiddie Academy of Cambridge, Dandelion Montessori Coop
Affordable Housing (> 6 Units)	Roosevelt Towers, 191 Washington Street, 181 Washington Street, 18 Bow Street, 33 Bow Street, 34 Linden Street, 110 Walnut Street, 109 Gilman Street
Residential Buildings (> 6 Units)	Millbrook Lofts, 181 Washington Street, 18 Bow Street, 34 Linden Street, 110 Walnut Street, Roosevelt Towers, Inman Square Apartments
Elderly Housing	Properzi Manor, Somerville Home, Hagan Manor, Burton F Faulkner Towners
Large Employers	Somerville Hospital, Greentown Labs, 561 Windsor, Formlabs, Paint Nite, Holiday INN, ABM Industries, Gentle Giant, Angelic Corporation, Market Basket, Target, Cataldo Ambulance Services, Green Cab, Somerville High School, Triumvirate Environmental, 283 Norfolk Street

FIGURE 3.7: EXISTING CONTEXT

Site Context

- Large Employers
- Religious Institutions
- Daycares
- Schools
- Elderly Housing
- Residential Buildings (>6 Units)

** Also a Large Employer*
** Also a Residential Building (>6 Units)*
** Affordable Housing (>6 Units)*

- Existing Civic Space
- Proposed Civic Space
- Proposed Development
- Area of Study
- Somerville/Cambridge City Line

N

0' 300' 700' 1400'

CONTEXT – FUTURE CONDITIONS

Once the GLX station arrives and the proposed project is constructed, new populations of workers and residents will populate the square, use patterns will evolve and planned civic spaces should anticipate and respond to that evolution. Depicted here are the existing conditions within the study area combined with the imagined future buildout of the development blocks.

While impossible to predict the future, the extension of the Green Line is expected to have an enormous impact on the area. Introducing new stations at Union Square and Washington Street will serve to greatly elevate accessibility levels to the greater regional transportation network and into the heart of Union Square. Framed by these new transit nodes, the transit oriented development will add approximately 2.4 million square feet across the D Blocks. 60% of this development capacity will be destined for commercial uses, providing the space that will expand the existing workforce with 5,000 new jobs. Similarly, multi-family residential buildings will also be constructed. In total, approximately 1,000 new residences will be delivered, twenty percent (approximately 200 units) of which will be permanently affordable. Supporting these uses and enhancing the public realm, the street level of the proposed buildings will be enlivened with active ground floor uses.

Beyond the immediate project area, additional projects are either planned or currently under construction. An itemized summary of both these and proposed D Block projects are itemized in the table below.

The site context of building types and uses, combined with the proposed building programs of the proposed development will help guide the character and type of civic space assigned during the design and site plan review stage, ensuring that the civic spaces will serve a range of users, from the elderly, to school children, to day time workers and resident families.

While both the commercial and residential build-out will occur over time, the implementation overview section of the application document describes the project's phasing across the D Blocks. In addition, the Build-Out Program Estimate (Table 9) outlines the target program on a parcel by parcel basis, including the approximation of the delivery of market rate and affordable housing units.

TABLE 3.3: ADDED FUTURE USES

USE TYPE	EXAMPLES IN THE STUDY AREA
Schools	New Cambridge High School
Affordable Housing (> 6 Units)	D7.1, D7.2, D.5.3, D2.2, D4.3, D3.2, all residential buildings as currently planned will have 20% affordable housing
Residential Buildings (> 6 Units)	D7.1, D7.2, D.5.3, D2.2, D4.3, D3.2, 1065 Cambridge Street
Large Employers	D1.1, D1.2, D6.1, D6.2, D2.1, D3.1, D3.3

FIGURE 3.8: FUTURE CONTEXT

WALKSHED ANALYSIS

The walkability to each existing space was measured to determine areas of the neighborhood that are under-served by specific civic space types. A 5-minute walkshed analysis of existing spaces was performed based upon civic space centroids for each of the existing civic space types identified in Table 3.4. The walkability to civic spaces within the study area were mapped individually by subtypes from the zoning overhaul and then a composite map was compiled. In combination, the walkshed analysis helps to identify the percentage of the study area that has access to each civic space type. It should be noted that the analysis takes account of only those spaces captured within the study boundary and that should a comprehensive walkshed analysis be made that extends beyond the boundaries - very few civic space "deserts" would be revealed. After preparing and reviewing the maps, the following observations about each subtype are provided.

CENTRAL PLAZA

The two central plazas in the study area are Union Square Plaza and Mayer Alfred E. Vellucci Community Plaza (Inman Square, Cambridge). The parks' combined walksheds serve the majority of the study area (~54% of study area), with gaps along the outer edges in the west, north, east, and southeast.

PUBLIC COMMON

The two public commons in the study area are Central Hill Park and Central Hill Park (Library).

As the parks are adjacent to each other and located towards the northern edge of the study area, the parks' combined walksheds serve the central and north-central portion of the study area (~31% of study area).

COMMUNITY PARK

The two community parks in the study area are Lincoln Park and Art Farm (only partially improved). The parks' combined walksheds serve the east, central, and west portions of the study area (~47% of study area). The south and north portions are unserved.

GREEN

The only green in the study area is Pearl Street Park (Gilman Square).

The park's walkshed serves a limited (3% of study area) area around the park, located in the north of the study area.

NEIGHBORHOOD PARK

The fifteen neighborhood parks in the study area are Glen Park/Capuano Playground, Prospect Hill Park, Perry Park, Nunziato Field, McCarthy/Capuano Field, Edward Leathers Community Park, Milk Row Cemetery, Senator Corbett McKenna Park, Cummings Schoolyards, Osgood Park, Somerville Community Growing Center, South Street Farm, and Walnut Street Park, as well as Donnelly Field and Gannett Warren Pals Park in Cambridge.

The parks' combined walksheds serve the majority of the study area (~57% of study area), with gaps in the center, southwest, and east edge.

POCKET PARK

The eight pocket parks in the study area are Nunziato Dog Park, Central Hill Park Playground, Stone Place Park, Allen Street Community Garden, Quincy Street Park, Avon Community Garden, and Palmacci Playground, as well as Maple Avenue Park (Duffett Tot Lot) in Cambridge.

The parks' combined walksheds serve the central, west, northwest, and north portions of the study area (with an isolated pocket park in the southwest) (~32% of study area). There are unserved portions in the center-west. Most of the east and south of the study area are unserved.

In order to look at the walkshed findings from another perspective, the walkshed maps and the D Blocks were specifically reviewed to determine which civic space types each block had access to, in order to highlight what opportunity might exist to fulfill a void in accessibility. The table below itemizes the six subtypes captured within the study area, denoting whether the type is accessible by a D Block in its entirety, only partially, or if it that type is not within a five minute walk. It should be noted that it is not the assumption of the applicant that a void alone constitutes a 'need', but instead that it is one of several indicators that should be taken into consideration, amidst an evolving context of users and their preferences.

Based on this perspective, the D Blocks are best suited to fulfilling neighborhood gaps for Neighborhood Parks, Greens and Public Commons. D1, D2 and D4 can all serve to fill gaps for more than two subtypes and their consideration as locations for civic spaces would expand the range of current accessibility. Alternatively, D7 is within a five minute walk to five of the six subtypes.

All walkshed data, including centroids and polygons, were received from the City of Somerville August 2017 and produced using ArcGIS.

TABLE 3.4: D BLOCK ACCESSIBILITY BY TYPE

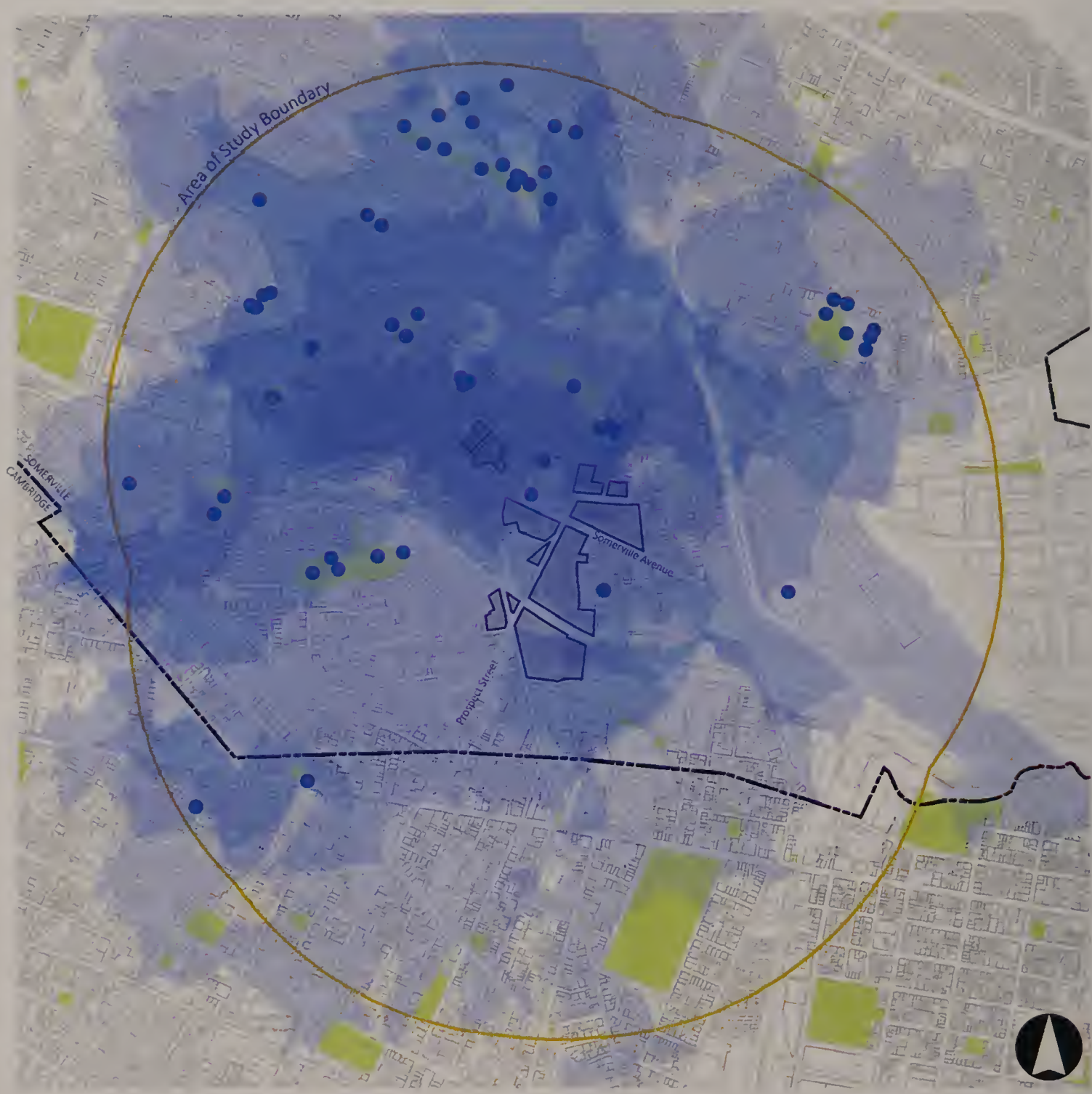
	Central Plaza	Public Common	Community Park	Green	Neighborhood Park	Pocket Park
D1	●	○	●	○	◉	●
D2	●	○	●	○	○	●
D3	●	○	●	○	◉	◉
D4	●	○	●	○	○	◉
D5	●	◉	●	○	●	●
D6	●	○	●	○	◉	●
D7	●	●	●	○	●	●

● Entirely included in walkshed to civic space noted

◉ Partially included in walkshed to civic space noted

○ Not included in walkshed to civic space noted

FIGURE 3.9: COMPOSITE WALKSHED



Composite Walshed

5-minute Walshed

1 Type — 6 Types

Civic Space Use Centroids

Existing Civic Space

Proposed Development

Area of Study

Somerville/Cambridge City Line

Scale 1"= 700'-0"

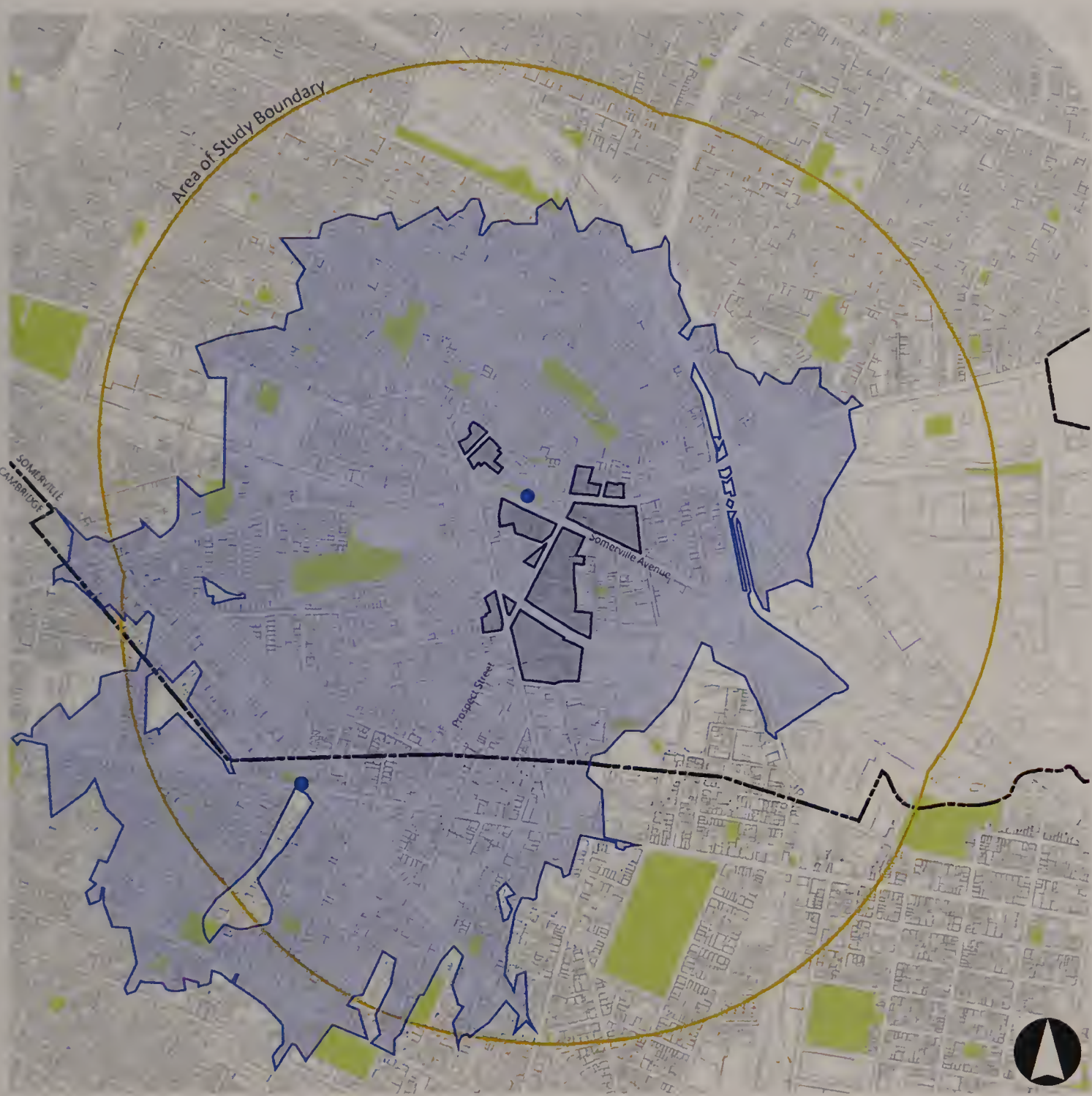
0' 350' 700' 1400'

CIVIC SPACE OBSERVATION:

A large majority of the residents and workers in the study area can reasonably walk to one or more civic spaces. Residents and workers in the study area have best access to Central Plazas and Neighborhood Parks (> 50% coverage) and have least access to Pocket Parks (32% coverage) and Greens (3% coverage).

FIGURE 3.10: WALKSHED 1 — CENTRAL PLAZA

54% OF STUDY AREA SERVED



Central Plaza

- 5-minute Walkshed
- Civic Space Use Centroids

- Existing Civic Space
- Proposed Development
- Area of Study
- Somerville/Cambridge City Line

CIVIC SPACE OBSERVATION:

Slight majority of study has access to central plazas. All of the D Blocks are within a 5-minute walk of an existing Central Plaza.

Scale 1"= 700'-0"

0' 350' 700' 1400'

FIGURE 3.11: WALKSHED 2 — PUBLIC COMMON

31% OF STUDY AREA SERVED

Public Common

- 5-minute Walkshed
- Civic Space Use Centroids

- Existing Civic Space
- Proposed Development
- Area of Study
- Somerville/Cambridge City Line

CIVIC SPACE OBSERVATION:

Only the northern most D Blocks, D7 and D5, are within a 5-minute walk of a Public Common Space.

Scale 1"= 700'-0"

0' 350' 700' 1400'

FIGURE 3.12: WALKSHED 6 — COMMUNITY PARKS

47% OF STUDY AREA SERVED

Community Parks

- 5-minute Walkshed
- Civic Space Use Centroids

- Existing Civic Space
- Proposed Development
- Area of Study
- Somerville/Cambridge City Line

Scale 1"= 700'-0"

0' 350' 700' 1400'

CIVIC SPACE OBSERVATION:

All of the D Blocks are within a 5-minute walk of an existing Community Park.

FIGURE 3.13: WALKSHED 3 — GREEN

3% OF STUDY AREA SERVED

Green

- 5-minute Walkshed
- Civic Space Use Centroids

- Existing Civic Space
- Proposed Development
- Area of Study
- Somerville/Cambridge City Line

Scale 1"= 700'-0"

0' 350' 700' 1400'

CIVIC SPACE OBSERVATION:

None of the D Blocks are within a 5-minute walk of a Green as defined by the Union Square Overlay.

FIGURE 3.14: WALKSHED 5 — NEIGHBORHOOD PARK

57% OF STUDY AREA SERVED

Neighborhood Parks

- 5-minute Walkshed
- Civic Space Use Centroids
- Existing Civic Space
- Proposed Development
- Area of Study
- Somerville/Cambridge City Line

Scale 1"= 700'-0"

0' 350' 700' 1400'

CIVIC SPACE OBSERVATION:

The central region of the study area, comprised of portions of D1, D2, D3 and D4, are not currently within a 5-minute walk of a Neighborhood Park.

FIGURE 3.15: WALKSHED 4 — POCKET PARKS

32% OF STUDY AREA SERVED

Pocket Parks

- 5-minute Walkshed
- Civic Space Use Centroids

- Existing Civic Space
- Proposed Development
- Area of Study
- Somerville/Cambridge City Line

Scale 1"= 700'-0"

0' 350' 700' 1400'

CIVIC SPACE OBSERVATION:

With the exception of D4 and D3, all the D Blocks are within a 5-minute walk of Pocket Park.

DEMOGRAPHIC ANALYSIS

The study area was defined pursuant to the Civic Space Study requirements as a ½ mile from the center of the development site. Note that while the Study Area includes a portion of Cambridge for purposes of the civic space analysis, the underlying demographic data chosen only reflects the block groups located in Somerville.

DEMOGRAPHIC AND INCOME PROFILE

The demographic information in this Civic Space Study was obtained from the Environmental Research Systems Institute (Esri) geographic information system (GIS) software application. Esri presents the 2017/2022 demographic forecasts based on a variety of data sources including the most recent US Census Bureau data and surveys, the American Community Survey, the Internal Revenue Service migration data, building permit and housing start information, US Postal Service delivery count data and others. Esri's forecasting methodology may differ depending on the particular demographic indicator and data sources that are available. A detailed explanation of Esri's 2017/2022 Demographic Updates methodology can be found here: http://downloads.esri.com/esri_content_doc/dbl/us/J10268_Methodology_Statement_2017-2022_Esri_US_Demographic_Updates.pdf

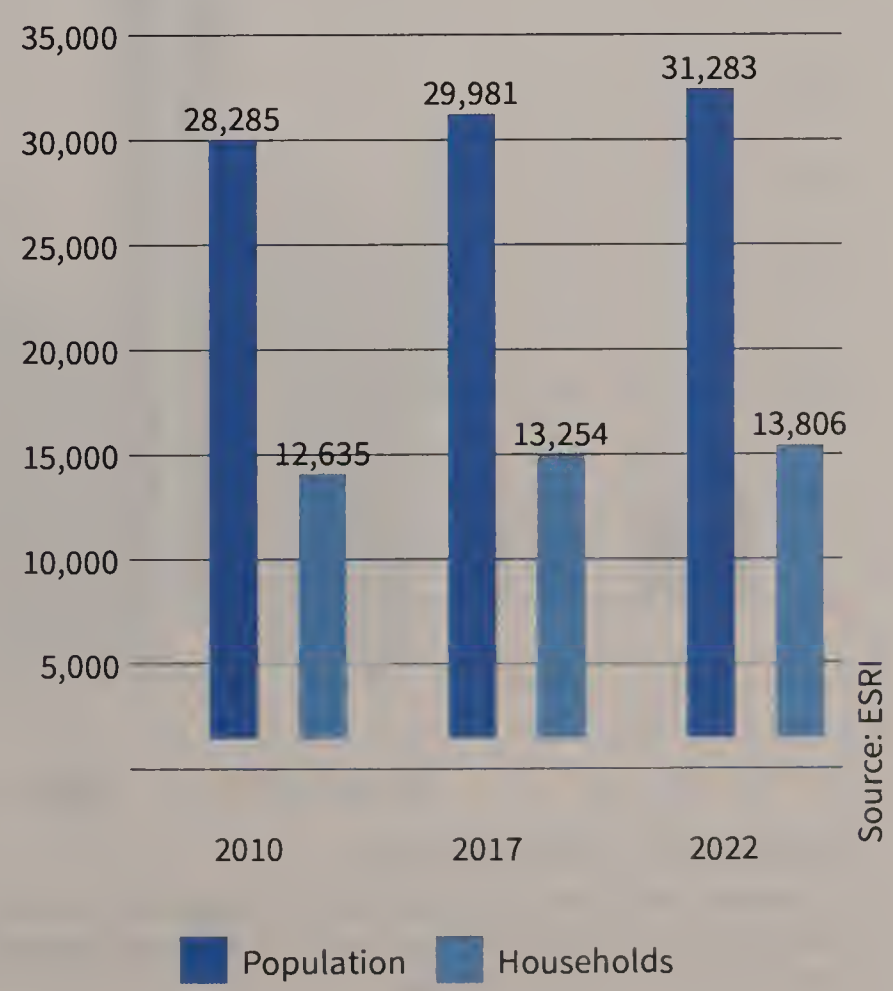
POPULATION & HOUSEHOLD GROWTH

Population in the Study Area has grown 6% from 28,285 in 2010 to 29,981 in 2017, at an average rate of 0.81% annually. The population is forecast to grow 4.34% to 31,283 by 2022, a rate of 0.85% annually. This represents a turnaround from the population decline of -3.5% from 2000 to 2010. Similarly, household growth has steadily increased 5% from 13,635 since 2010 to 13,254 in 2017, at an average rate of 0.65% a year. The number of households is forecast to increase by 4.16% to 13,806 by 2022, at an average annual rate of 0.82%, much faster than the 0.13% annual growth rate in households from 2000 to 2010.

In the Study Area, the current year population is 29,981. In 2010, the Census count in the area was 28,285. The rate of change since 2010 was 0.81% annually. The five-year projection for the population in the area is 31,283 representing a change of 0.85% annually from 2017 to 2022.

The household count in this Study Area has changed from 12,635 in 2010 to 13,254 in the current year, a change of 0.66% annually. The five-year projection of households is 13,806, a change of 0.82% annually from the current year total. Average household size is currently 2.25, compared to 2.22 in the year 2010. The number of families in the current year is 5,464 in the specified area.

FIGURE 3.16: INCREASING POPULATION & HOUSEHOLDS



CIVIC SPACE OBSERVATION:

An increasing population and household income number will increase demand for civic and open spaces as the development evolves.

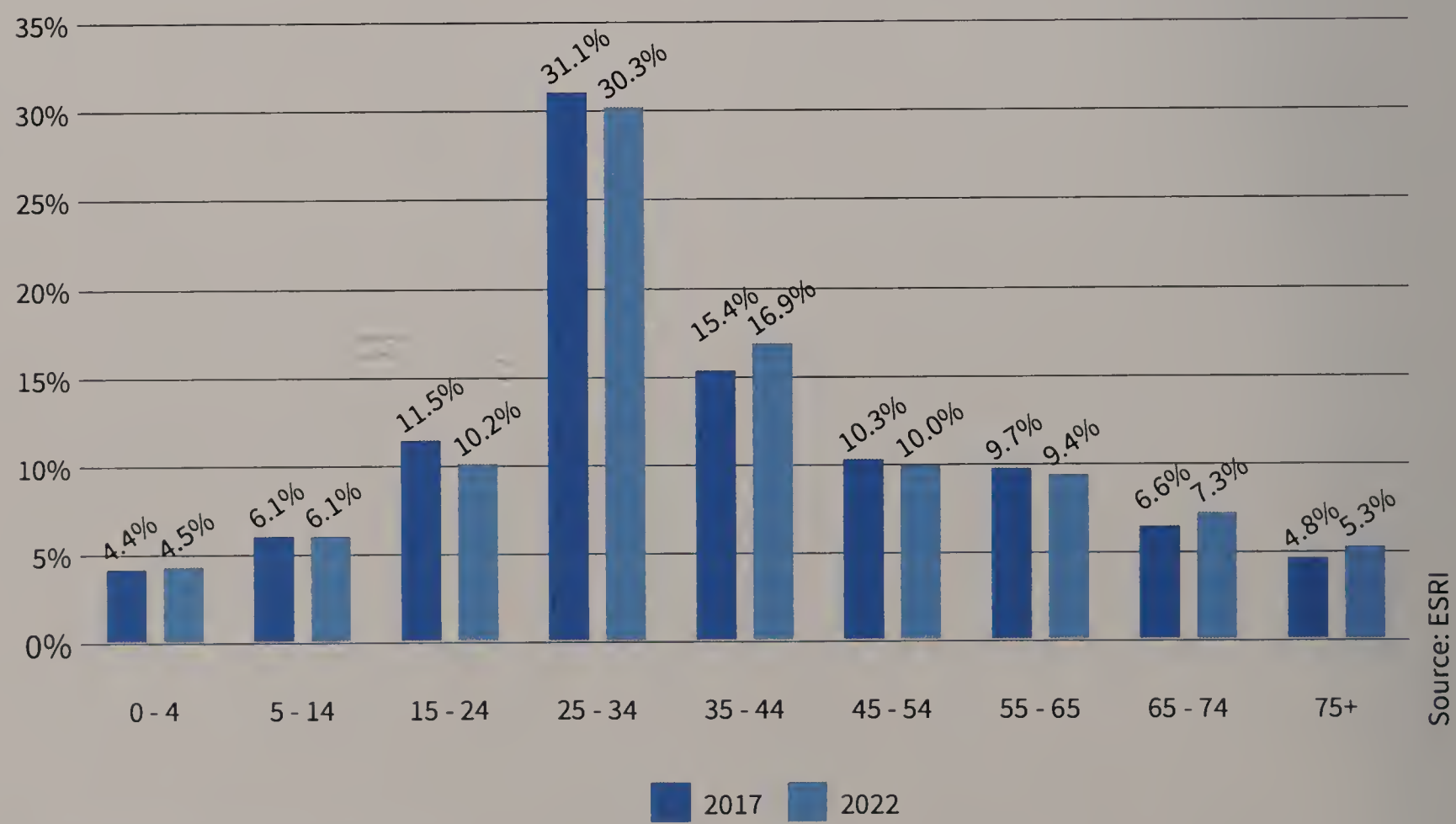
AGE

The population age breakdown within the Study Area for the current year 2017 and the forecast year 2022 are very similar, with Millennials comprising a significant segment. Nearly 1 in every 3 people falls into the 25- to 34-year-old group (31% for 2017). The median age is 33.9 years. By 2022, this dynamic stays fairly unchanged with 30% of the study area population in this age group and a slight uptick projected in the percentage of 35- to 44-year-olds from 15.4% to 16.9% as the Millennials grow older. Additionally, the 65 and older population is forecast to increase from 11.4% to 12.6%, respectively.

TABLE 3.5: TOTAL POPULATION BY AGE

	2017	PERCENT	2022	PERCENT
0 - 4	1,334	4.4%	1,396	4.5%
5 - 9	1,000	3.3%	997	3.2%
10 - 14	854	2.8%	903	2.9%
15 - 19	885	3.0%	882	2.8%
20 - 24	2,555	8.5%	2,309	7.4%
25 - 29	5,033	16.8%	4,806	15.4%
30 - 34	4,273	14.3%	4,673	14.9%
35 - 39	2,790	9.3%	3,160	10.1%
40 - 44	1,839	6.1%	2,134	6.8%
45 - 49	1,574	5.3%	1,618	5.2%
50 - 54	1,508	5.0%	1,503	4.8%
55 - 59	1,472	4.9%	1,437	4.6%
60 - 64	1,429	4.8%	1,517	4.8%
65 - 69	1,145	3.8%	1,238	4.0%
70 - 74	848	2.8%	1,038	3.3%
75 - 79	601	2.0%	752	2.4%
80 - 84	407	1.4%	481	1.5%
85+	432	1.4%	440	1.4%

FIGURE 3.17: INCREASING POPULATION & HOUSEHOLDS



CIVIC SPACE OBSERVATION:

Civic spaces should serve a diverse range of ages from small children to the elderly. The civic space needs of the largest groups ages 25-29 and ages 30-34 should be considered. And the needs of the expanding elderly population should be considered.

INCOME

Median Household Income in the Study Area is approximately at $63,000 for 2017 and projected to increase to $78,600 by 2022 (on a nominal basis, unadjusted for inflation). Household income distribution reveals an economically diverse group but with a significant 41% of the study area households earning less than $50,000 or 80% of the Study Area Median Household Income. A solid 32% of study area households earns more than $100,000, including those in the $200,000+ income bracket. The remaining 27% are moderate-income households earning between $50,000 and $100,000. The wide range reflects the differences in neighborhoods captured by the study area, which extends from East Somerville and Boynton Yards, areas that have experienced significant disinvestment over the last half century or so, to Prospect Hill and Spring Hill which have some of the higher household incomes of all Somerville neighborhoods.

FIGURE 3.18: HOUSEHOLD INCOME DISTRIBUTION

FIGURE 3.19: MEDIAN HOUSEHOLD INCOME

CIVIC SPACE OBSERVATION:

The Study Area is economically diverse. Civic space locations should be sited and distributed geographically in order to best serve the range of economic groups.

FIGURE 3.20: STUDY AREA DEMOGRAPHIC AND INCOME PROFILE

esri

Demographic and Income Profile

buffer
Area: 1.34 square miles

Prepared by Esri

Summary	Census 2010	2017	2022
Population	28,285	29,981	31,283
Households	12,635	13,254	13,806
Families	5,257	5,464	5,669
Average Household Size	2.22	2.25	2.25
Owner Occupied Housing Units	3,884	3,715	3,753
Renter Occupied Housing Units	8,751	9,539	10,053
Median Age	33.0	33.9	34.7
Trends: 2017 - 2022 Annual Rate	**Area**	**State**	**National**
Population	0.85%	0.67%	0.83%
Households	0.82%	0.63%	0.79%
Families	0.74%	0.58%	0.71%
Owner HHs	0.20%	0.58%	0.72%
Median Household Income	4.53%	2.22%	2.12%

	2017		2022	
Households by Income	Number	Percent	Number	Percent
<$15,000	1,933	14.6%	1,831	13.3%
$15,000 - $24,999	1,108	8.4%	1,046	7.6%
$25,000 - $34,999	888	6.7%	760	5.5%
$35,000 - $49,999	1,436	10.8%	1,193	8.6%
$50,000 - $74,999	2,080	15.7%	1,769	12.8%
$75,000 - $99,999	1,588	12.0%	1,673	12.1%
$100,000 - $149,999	2,264	17.1%	2,809	20.3%
$150,000 - $199,999	922	7.0%	1,301	9.4%
$200,000+	1,035	7.8%	1,423	10.3%
Median Household Income	$62,989		$78,598	
Average Household Income	$87,597		$106,079	
Per Capita Income	$38,986		$47,048	

	Census 2010		2017		2022	
Population by Age	Number	Percent	Number	Percent	Number	Percent
0 - 4	1,363	4.8%	1,334	4.4%	1,396	4.5%
5 - 9	888	3.1%	1,000	3.3%	997	3.2%
10 - 14	822	2.9%	854	2.8%	903	2.9%
15 - 19	958	3.4%	885	3.0%	882	2.8%
20 - 24	2,812	9.9%	2,555	8.5%	2,309	7.4%
25 - 34	8,801	31.1%	9,306	31.0%	9,479	30.3%
35 - 44	4,263	15.1%	4,629	15.4%	5,294	16.9%
45 - 54	3,126	11.1%	3,082	10.3%	3,121	10.0%
55 - 64	2,487	8.8%	2,901	9.7%	2,954	9.4%
65 - 74	1,485	5.2%	1,993	6.6%	2,276	7.3%
75 - 84	911	3.2%	1,008	3.4%	1,233	3.9%
85+	370	1.3%	432	1.4%	440	1.4%

Data Note: Income is expressed in current dollars.

Source: U.S. Census Bureau, Census 2010 Summary File 1. Esri forecasts for 2017 and 2022.

SOCIAL EQUITY

The following Environmental Justice (EJ) data, dated December 2012, was accessed from MassGIS in August, 2017. Polygons in the EJ data represent areas with high minority, non-English speaking, and/or low-income populations. Data in this layer were compiled for Census 2010 block groups from the 2010 census redistricting tables and from the American Community Survey (ACS) 2006-2010 5-year estimates tables. The Statewide EJ polygons were clipped to the ½-mile study area buffer in the following maps.

Block Groups were identified as EJ neighborhoods using the following three criteria:

PERCENT MINORITY POPULATION

From the Census 2010, non-minority is defined as "not Hispanic, white alone". The threshold for the EJ criteria is any Block Group with a percent minority greater than or equal to 25%.

ENGLISH LANGUAGE ISOLATION

Linguistic isolation was used as an indicator of limited English language. A household in which no person 14 years old and over speaks only English and no person 14 years old and over who speaks a language other than English speaks English "Very well" is classified as "linguistically isolated." In other words, a household in which all members 14 years old and over speak a non-English language and also speak English less than "Very well" (have difficulty with English) is "linguistically isolated."

Data from the ACS 2006-2010 estimates tables indicate households in which no one 14 and over speaks English only or speaks a language other than English at home and speaks English "very well". Any Block Group with 25% or more of all households identified as English-isolated was included as an EJ population.

INCOME

Median household income (in the past 12 months) data is from ACS 2006-2010 estimates. Any Block Group with a median household income in 2010 less than or equal to $40,673 was included as an EJ population.

OVERALL EJ POPULATION IN THE STUDY AREA

Figure 3.24 on the following page provides a composite overview of the environmental justice populations within the study area. It should be noted that this data is from 2010 and has likely changed over time. Similarly, future changes to areas identified for development will also likely have an influence on environmental justice boundaries. Depicted on the pages that follow are best representations of the existing condition of the study area provided the data made available by the State of Massachusetts. In Summary:

- The study area includes minority, income, and English isolation EJ population block groups.
- The study area includes block groups that have multiple EJ criteria (minority and income).
- The study area includes block groups that have all three EJ criteria.

PERCENT MINORITY POPULATION IN THE STUDY AREA

To understand the intensity of the EJ criteria, percent minority population was mapped per block group. See Figure 3.25.

- Block groups with minority populations less than 25% have been excluded because they do not meet the EJ threshold.
- Block groups with the highest minority populations are centered around center of the study area (Boyton Yards area), East Somerville (north of McGrath Highway and Washington Street), and in Cambridge southeast of the intersection of Hampshire Street and Columbia Street.

PERCENT ENGLISH LANGUAGE ISOLATION IN THE STUDY AREA

To understand the intensity of the EJ criteria, percent English language isolated households was mapped per block group. See Figure 3.26.

- Block groups with households with less than 25% English language isolation have been excluded because they do not meet the EJ threshold.
- Two block groups are linguistically isolated in East Cambridge, respectively 54.5% and 25.4% households without English proficiency.

MEDIAN HOUSEHOLD INCOME IN THE STUDY AREA

To understand the intensity of the EJ criteria, median household income was mapped per block group. See Figure 3.27.

- Block groups with median household income greater than $40,673 have been excluded because they do not meet the EJ threshold.
- Block groups with the lowest median income are in the Inner Belt (east of McGrath Highway) and in Cambridge north of Cambridge Street between Prospect Street and Willow Street.

FIGURE 3.21: ENVIRONMENTAL JUSTICE MAP — OVERALL

Environmental Justice neighborhoods

- Minority
- Income
- Minority and Income
- Minority, Income, and English Isolation

- Existing Civic Space
- Proposed Development
- Area of Study
- Somerville/Cambridge City Line

CIVIC SPACE OBSERVATION:

A large portion of the Study Area includes environmental justice populations, especially the east-side of the Study Area. Civic spaces located on any of the D blocks, except for D7, would be located in an area directly serving Environmental Justice populations.

Scale 1" = 700'-0"

0' 300' 700' 1400'

FIGURE 3.22: ENVIRONMENTAL JUSTICE MAP — RACE

Minority Population (other than non-hispanic white)

- 25%-30%
- 30%-40%
- 40%-50%
- 50%-80%

- Existing Civic Space
- Proposed Development
- Area of Study
- Somerville/Cambridge City Line

Scale 1"= 700'-0"

CIVIC SPACE OBSERVATION:

All of the D Block parcels, except for D7, are in areas with a percent minority greater than or equal to 25% and Blocks D1, D2 and D3 are in areas where the percent minority is greater than 50%.

FIGURE 3.23: ENVIRONMENTAL JUSTICE MAP — LANGUAGE

Median Household Income

- $38,000 - $40,673
- $28,000 - $38,000
- $20,000 - $28,000
- $15,000 - $20,000

- Existing Civic Space
- Proposed Development
- Area of Study
- Somerville/Cambridge City Line

Scale 1"= 700'-0"

CIVIC SPACE OBSERVATION:

The D Blocks are primarily surrounded by households with English proficiency.

FIGURE 3.24: ENVIRONMENTAL JUSTICE MAP — INCOME

Households without English Proficiency

- 25.4%
- 54.5%

- Existing Civic Space
- Proposed Development
- Area of Study
- Somerville/Cambridge City Line

Scale 1"= 700'-0"

CIVIC SPACE OBSERVATION:

The D Blocks are not located in areas that qualify as Environmental Justice areas due to income levels. However, areas northeast of D1, and D5 and south of D3 meet the Environmental Justice criteria for income.

NEEDS ASSESSMENT

To assess need, civic space and open space discussions from preceding planning processes in Somerville and Union Square were reviewed and distilled. A summary is outlined on the table that follows. Common themes among the various documents are identified by the colored dots next to each item.

TABLE 3.6: IDENTIFIED CITYWIDE CIVIC SPACE NEEDS

	OPEN SPACE AND RECREATION PLAN (OSRP), SOMERVILLE BY DESIGN	
●	Playgrounds	Somerville currently has 36 playgrounds, a number of which have been recently constructed or upgraded. The quantity and distribution of playgrounds results in the vast majority of households being within a five minute walk of a playground.
●	Performance Space	The arts play an important and vital role in the city's identity and public open space.
	Increased Open Space	Increase Somerville's network of open space and recreational resources, identifying neighborhoods underserved by open space so as to develop a strategic plan to to acquire land and construct new parks to serve them.
●	Community Gardens	There are 11 community gardens in Somerville, all of which are at capacity. Currently, the waiting list has over 200 residents on it, indicating a need for additional lots and/ or a greater optimization and efficiency of the current lots.
	ADA Compliance	Continue to make Somerville's parks more accessible, assuring compliance with ADA laws and incorporating tenets of universal design.
	Athletic Fields	Playing Fields are included on 10 properties in Somerville. Currently all the fields are booked to capacity and outweigh the demand however none of the civic spaces in the development are of a sufficient scale for sports fields.
	Schoolyards	The city has recently placed an importance on building better play and learning environments adjacent to schools.
	Parks Programming for Health and Fitness	Provide opportunities for residents of all ages to enjoy the benefits of physical activity, while balancing the need for unprogrammed recreation as well.
●	Accessible Space and Space for Seniors	It is important that the elderly populations of the city are served by including programs such as walking, sitting, yoga, Tai Chi, socializing and dancing in open spaces.
	SOMERVISION, CITY OF SOMERVILLE	
●	Multi-Cultural and Multi-Functional	Create a network of vibrant public open spaces and shared use paths throughout the city that are multi-purpose, promote healthy living, and reflect changing recreational interests and cultural opportunities.
●	Ecological Green Infrastructure	Open spaces within the City of Somerville should use green technologies and methods that increase permeability, reduce energy costs and conserve public resources.
●	Art Based	Promote and recognize Somerville as a center of arts and creativity. Place an emphasis on supporting local art and cultural institutions so that they succeed, network and grow. Introduce a mix of spaces for creative production, performance and exhibition.

LEGEND

- Urban agriculture/community gardens
- Arts and creativity
- Pedestrian experience
- Community involvement
- Senior oriented
- Sustainability

●	Transit Oriented Design	Transform key opportunity areas associated with the new Greenline stops into dynamic, mixed use transit oriented districts that serve as economic engines to compliment the neighborhoods of Somerville.
●	Pedestrian Oriented Design	It is important for public spaces to be pedestrian oriented, making it easy and safe for pedestrians to circulate.
●	Community Gardens and Urban Agriculture	There should be increased opportunities for urban agriculture, including safe soil quality, public greenhouse for year-round gardens and adding or rehabilitating existing community gardens.
	Desired Character	It is a goal to design and maintain a healthy and attractive public realm that fosters community connection, including streets, sidewalks and other public spaces.
	NEIGHBORHOOD PLAN, SOMERVILLE BY DESIGN	
●	Arts/Creativity	Somerville's creative and art based economy is a core part of the community identity. It is important to foster Union Square's identity as a place for creativity enterprises and individuals. Create spaces for them to think, create, publish, perform, sell and teach.
●	Urban Agriculture	Food is already an essential part of the existing character of Union Square. By encouraging a wider variety of growing options for gardeners and farmers, Union Square can truly embrace agriculture as part of everyday life.
●	Public Involvement	It is important to involve community members in a collaborative process on the review of development projects.
●	Pedestrian Experience	Somerville's culture unfolds on a daily basis on the sidewalk and public spaces, therefore, it is important to improve pedestrian streets for increased activity. Provide seating, benches, parklets, and outdoor cafes to add to the unique character and enhance the public life.
●	Space for Seniors	Seniors are an increasing population in Somerville and spaces should be designed to be aging friendly.
	Neighborhood Park	The plan cited the neighborhood park on the D4.3 block.
	Plaza	The plan cited the plaza on the D2 block approaching the MBTA station.
	UNION SQUARE ZONING	
●	Open Space Area	At full build out, 25% of the development site, excluding alleys and any land occupied by the MBTA GLX station must be improved as: at least 70% civic space and up to 30% public realm improvements.
	Civic space types	Two or more civic spaces must be provided of different types, sizes, and locations.
	Civic space types	At least one neighborhood park of at least 27,000 SF and one plaza.
●	Green civic space	25% of the cumulative land area provided as civic space must be green space.
●	Green civic space	50% of the cumulative land area provided as civic space must be green space or covered by tree canopy at full maturity.
	Payment in lieu	Planning Board may permit an in lieu payment for up to 10% of the required amount of civic space.
●	Civic Space Design	Each civic space must be reviewed as part of a public design and site plan review process.
	Civic space standards	Each civic space type must conform to design standards related to size, seating, number of trees, previous area and green space.

LEGEND

- Urban agriculture/community gardens
- Arts and creativity
- Pedestrian experience
- Community involvement
- Senior oriented
- Sustainability

CITY DEPARTMENT FEEDBACK

The feedback from multiple city departments provided another factor in determining the open space needs in Union Square. Conversations with the Office of Sustainability and Environment helped frame our approach through the lens of resiliency, while the Parks and Recreation as well as Parks and Open Space Departments outlined unmet needs, providing aspirations for continuing to grow the inventory of rectangular field sites throughout Somerville.

The collective feedback from these departments, sustained engagement with the community, as well as our continuous interaction with the planning department through the Neighborhood Planning process and subsequent adoption of zoning has been instrumental in informing the approach to open space. Assessing Somerville's present needs while simultaneously contextualizing them towards a more sustainable future has served to reinforce the direction outlined within this application and will inform the design and programming of these spaces that is yet to come.

OFFICE OF SUSTAINABILITY AND ENVIRONMENT

Oliver Sellers-Garcia, Director of the Office of Sustainability and Environment, and Hannah Payne, Sustainability Coordinator provided unique insight into the needs for open space in Union Square. They described unmet needs in Union Square as similar to the needs for the greater city, considering the density of buildings inherently limits the supply of open space.

The city has engaged in significant research to prioritize resiliency, creating "SustainaVille", the city's resource for programs and initiatives to reduce Somerville's contribution to climate change and to develop the city's ability to prepare for the impacts of climate change. In light of their research, Mr. Sellers Garcia offered that open spaces could be considered in two ways – as assets that need to be protected and as part of the solution. He described the performative role of open spaces as an important one, explaining the need for open spaces to perform as much of a cooling function as possible to combat rising temperatures. Ms. Payne offered that the inclusion of more vegetation, more trees and their provision of additional shade serves to reduce the heat island effect that affects comfort in dense urban areas like Somerville.

One of the initiatives of "SustainaVille", the 'Climate Change Vulnerability Assessment' from June 2017 was particularly useful in identifying challenges specific to Union Square's open spaces. The low-lying nature of the area was noted as at risk for flooding, a risk Ms. Payne said the OSPCD had a done a great job of addressing through the storm water management potential in open spaces. This duality of purpose was a point Mr. Sellers-Garcia expanded on by explaining Somerville Climate Forward will make sure we think about how we treat every square foot. The city understands the priority that the community has placed on Open Space and increased vegetation. The goal of SomerVision to increase space, is not where the city intends to stop. Instead, the pursuit is for the maximization of the utility of these spaces, wherever they may be. This interest is protected in the midst of competing desires for the functional programming of these spaces in that the implementation of sustainable strategies are not in conflict with how the space may be used. Instead, sustainability and climate goals coexist with programming efforts to maximize benefits for all.

DEPARTMENT OF PARKS AND RECREATION

Jill Lathan, Director of the Department of Parks and Recreation also provided her perception of present unmet needs in Union Square. She too identified the need for spaces that can fulfill multiple roles, highlighting above all else the need for spaces to accommodate larger, recreational uses. Ms. Lathan was thankful for the recent opening of a new under-8 turf field but insists on the need to continue to grow the city's inventory of recreational spaces, especially for older youth. Understanding constraints on available land for uses of this scale, Mr. Lathan saw the constraint as an opportunity to think outside the box on how the need is fulfilled.

Beyond larger fields, she saw a need to develop recreational opportunities within smaller spaces. Pocket parks or other spaces that are largely often passive, still have the opportunity to incorporate active uses, whether they take the shape of bocce ball courts, horse-shoes, or other varieties of active programming.

DEPARTMENT OF PARKS AND OPEN SPACE

When it comes to open space needs, Arn Franzen, Director of Parks, echoed the sentiment heard from other departments: "the city fights for every square foot of space we can get." By extension, he acknowledged the very real need for fields, and subsequently the difficulty in accommodating their large size. In conversation with Mr. Franzen, it was apparent this identified need was a byproduct of the high utility rate the existing fields receive.

Put another way, successful open spaces were utilized, and useful open spaces. Beyond a space's typology, he spoke to the complex relationship between priorities for open spaces. More specifically, while design should be of the highest priority, even the most beautifully designed park could be deemed unsuccessful if it was never used. While acknowledging there are no guarantees, Mr. Franzen, like Jill Lathan and Oliver Sellers-Garcia elevated the need for varied programming to promote utility. The creation of social, passive, and active spaces together within a park or open space provide the requisite opportunities for a broad user base.

This broad user base was one Mr. Franzen referenced again when highlighting the critical role the community process plays in defining spaces. He cited both the challenge and necessity to consider all user groups even if their voices were unheard. He mentioned the difficulty and responsibility to think about community members that are absent from meetings, specifically referencing, the 0-5 age group, teens, seniors, and the low-income communities who may be unable to actively participate.

In summary, Mr. Franzen understands the challenges in fulfilling a broad range of user needs but sees them within the context of opportunity- opportunity for Somerville to lead and set a high bar for other communities to follow. "Fulfilling multiple objectives should not be a 'reach' – but the expectation.

FINDINGS FROM EXISTING CONDITIONS ANALYSIS

The existing condition analysis study revealed the following considerations that inform our planning and design approach for civic spaces:

CIVIC SPACE TYPE NEEDS

- Residents and workers in the study area are best served by Central Plazas and Neighborhood Parks (over 50% of the study area has walkable access).
- Residents and workers in the study area are least served by Pocket Parks and Greens (less than a third of the study are has walkable access) that can provide moments of repose close to home and work.
- Passive areas, playgrounds and community gardens are the most common landscape use types.
- Civic spaces should serve a diverse range of ages from small children to the elderly.
- The civic space needs of the largest groups ages 25-29 and ages 30-34 should be considered.
- Spaces for seniors are viewed as important as that population is projected to grow.

CIVIC SPACE LOCATIONS NEEDS

- As the neighborhood evolves into an employment center and 2.4 million square feet of development are added, new patterns of movement will evolve and the civic space plan should anticipate future demand.
- The eastern portion of the neighborhood does not have the same level of accessibility to diverse civic space types as the northern and western regions of the study area.
- Strategically planned civic spaces types on D1, D2, and D4 would improve the current accessibility levels from these blocks.
- D7 is within a five minute walk of five of the six subtypes captured within the study area.
- Civic spaces located on any of the D Blocks, except for D7, would be located in an area directly serving Environmental Justice populations as defined by most recent census data.

COMMUNITY FEEDBACK

US2 hosted two neighborhood meetings for the CDP and the development team received many comments about open space, some of which coalesced, while other expressed differing views from each other. The feedback received was reviewed and considered as the CDP proposal provided herein was prepared. An overview of the two meetings is provided below and additional details about the neighborhood meetings are provided in Appendix 2.

On September 5, 2017, US2 hosted a CDP Neighborhood Meeting as required by the Union Square Zoning. The neighborhood meeting was open to the public and was held at the City of Somerville Public Safety Building. Local residents, business people, property owners and other community stakeholders were notified of the meeting via newspaper advertisements, mailings, emails, posters and hand delivered flyers as required by ordinance.

Over 140 people attended. Fourteen members of the US2 development team representing development, urban design, landscape architecture, transportation, community engagement and economic development were present to describe the project, discuss CDP details, respond to questions and solicit feedback.

The meeting presentation included the following topics related to the Union Square Revitalization project: project overview, process overview, employment center, community benefits, urban design, existing civic space, open space, transportation and infrastructure improvements. Participants were asked to offer specific feedback related to the topics and were also invited to participate in an interactive exercise regarding civic space type preferences and walking desire paths. As they departed, each attendee was asked to complete an exit survey.

It was a well-attended event and the development team received many comments regarding civic space. In general there was strong interest in open space and a fairly consistent desire for green planted spaces and "urban oasis" over hard spaces. One potential exception to this was the plaza area at D2 connecting to the future Green Line stop; however, there were voices that expressed a desire for this to be greener as well. There was also a lot of interest in the sustainable measures of the civic spaces and connective public realm streetscape, expressing a desire for substantial tree canopy, good growing conditions, and plant species diversity.

In addition to the feeling of green, the "arts-directed" expression of many of the example images were well received as a way to reflect the unique character of Union Square, referencing the Fluff Festival, Porch Fest and the like.

Some people liked the distribution of spaces across the development area, however others expressed a desire to have it consolidated. Many people liked and encouraged the creation of informal and formal connections between the various civic spaces. Many people had trouble understanding the size of the open space parcels, wondering if they were too small. To help address this understanding, a set of diagrams that compares the size of the proposed civic spaces to existing Somerville spaces is included the Development Proposal section of the application.

There was a variety of opinions about whether civic spaces should be located on the street side of the development parcels or tucked behind them. The street side was favored due to its active public qualities, making it more used and thus more safe; the quieter locations were favored as a place to step away from the activity of the street and relax. While it was expressed that there was a need for playing fields in the area, it seemed generally understood that these could not fit on the D Blocks and alternative future sites might be made available by the City of Somerville.

Considerable discussion at the open house centered on the location of the neighborhood park. The original location suggested in the Neighborhood Plan was on D4.3. After community feedback during the zoning process to consider other locations, US2 considered D1 and D7 as potential locations. Upon further analysis and considering a variety of factors, the D1 location emerged as the preferred location so it was presented at the meeting. D4.3 was only mentioned as a preference by one or two participants in the neighborhood meeting; however, there was divided opinions as to whether D1.2 or D7.2 would be a better location for this neighborhood amenity.

The interactive exercise regarding civic space type preferences and walking desire paths or "pin exercise" showed strong support for both locations. D1.2 received the most pins indicating support for a civic space at this location with a majority indicating that a neighborhood park or green type would be preferable. Similarly, D7.2 received the second most pins and the large majority of those pins also favored the neighborhood park use.

The post it notes and verbal comments were also split with support for both locations ("D1.2 park – best idea ever", "D7 = perfect spot for neighborhood park"). Some attendees indicated D7.2 as a more certain success due to its proximity to existing travels patterns and other civic spaces and others viewed D1.2 as a location that balanced the opportunities of civic space on the east and the west of the neighborhood.

Given the level of interest in the park location and at the request of neighborhood residents, another neighborhood meeting was hosted on October 18,

2017. This meeting was organized as a presentation (see Appendix 2 for presentation) and discussion session focused on the civic space study, park alternatives analysis, and a more detail review of the proposed D1.2 neighborhood park location. The meeting was noticed via a newspaper ad, flyers, emails, a geographically targeted Facebook ad (12,000 views) and direct notices to neighborhood groups (e.g. Union Square Main Streets, Somerville Local First, Union Square Neighbors, etc.). Over 50 community members attended and the discussion was thoughtful and passionate.

Several attendees commented on the importance of adding new open space, doing it thoughtfully and ensuring that a broad group of residents could offer their input at the meeting and throughout the process. Several participants acknowledged the importance of reviewing the alternatives from several perspectives including considerations for existing residents, small business owners, workers and visitors as well as future residents, business owners, workers and visitors. Others also wondered how future improvements, like the athletic fields envisioned on Merriam Street, should influence the planning.

During the discussion, there were divided views as to whether D1.2 or D7.2 as a better location for the neighborhood park. D7.2 advocates cited its solar orientation, location near existing neighborhood activity nodes and proximity to the City of Somerville senior and young disabled housing as advantages. Advocates of D1.2 highlighted its location in an underserved portion of the neighborhood, its central location between the two future MBTA stops and its proximity to affordable housing on Washington Streets and Linden Streets. Residents also described challenges for each of the parcels. To some, D7 felt like a dead-end and would face a number of "backs" of buildings. To others, the D1.2 podium/ park interface needed more design and D1 would benefit from more sun light late in the afternoons and evening.

Some of the comments provided at the meeting focused on specific designs details including park program elements (e.g. areas to sit, areas for children, outdoor music area, etc.), park green space, street trees, treating neighborhood edges and activating retail at park edges. These details will be explored more fully during the Design and Site Plan review stage of the process.

CONCLUSIONS

Providing new high quality, publicly accessible open space in Union Square is a goal shared by SomerVision, the Neighborhood Plan, the Union Square Zoning and the US2 development team. The CDSP process associated with civic and open spaces involved an interactive dialogue with community members through both formal and informal meetings, as well as multiple meetings with staff members of the City of Somerville. What has become clear throughout the process is that, unsurprisingly, the D Blocks themselves are insufficient to meet all the open space needs of the City of Somerville. However, the task remains to establish a framework for open space for the D Blocks that best meets the needs of the community while balancing the other objectives of the development relating to creating a jobs center, adding affordable housing and activating the public realm as well as supporting infrastructure and community benefits priorities.

The applicant acknowledges the difficulty in assessing planning alternatives that should respond to both the present and future condition. Similarly, the continually evolving nature of data presents nuances that require careful inquiry, and a constant challenging of assumptions. In light of these challenges, our findings have, without question, informed the planning effort. Amidst an evolving context of users and their preferences, the executed Civic Space Study's influence on the CDP is summarized below.

TABLE 3.7: CSS FINDINGS AND CDP INFLUENCE

FINDING	CDP OPEN SPACE PLAN INFLUENCE
Zoning Requirements	
17.5% civic space required, 10% of required can be fee in lieu.	Civic space plan was designed to meet these minimum area requirements.
Include one 27,000 SF neighborhood park and one plaza.	Civic space plan includes one 27,000 SF neighborhood park and one plaza civic space type.
Civic spaces minimum Green Space requirements (also neighborhood meeting participant's promoted more green).	Civic spaces will be designed to meet the minimum green space requirements of the ordinance.
Civic space type design requirements for the 9 permitted types.	Civic spaces will be designed to meet the size, seating, tree count, impervious area and green space area requirements of the zoning.
Civic Space Locations, Master Plan	
The eastern portion of the neighborhood lacks the civic space access that the north and west enjoy.	The required neighborhood park is planned for D1.2 to address this inequity.
The GLX station and 2.4 million SF of new uses will result in new populations of workers and residents, use patterns will evolve and planned civic spaces should anticipate and respond to that evolution.	Six of the seven D blocks are proposed to include a civic space and the two main civic spaces, the D2 Plaza and the D1.2 Neighborhood Park will be centrally located to serve a breadth of users.
D1, D2 and D4 are best suited to filling neighborhood gaps for parks, greens and commons.	D1 and D2 include the two largest civic spaces and D4 includes three different civic space types.

FINDING	CDP OPEN SPACE PLAN INFLUENCE
Civic spaces located on any of the D Blocks, except for D7, would directly serve environmental justice populations.	The interest in serving under-served populations and environmental justice populations motivated the decision to place the Neighborhood Park on D1.2.
Residents requested a greater civic space buffer from Webster Street residences to the D3 Block	D3.2 civic space was relocated from Windsor Street to Webster to provide a more substantial buffer.
D7 is best served of all the D Blocks by existing civic spaces, but several neighbors like it as the Neighborhood Park location.	Two conflicting findings emerged for D7. As a compromise, a civic space is planned for the D7 - a 6,000 SF park rather than a neighborhood park.
Neighbors were divided about whether the Neighborhood Park should go on D1.2 or D7.2 (neighborhood meeting feedback).	As part of our planning, both locations were assessed as Neighborhood Parks and in the context of the overall development goals, D1.2 emerged as the recommended location. A sizable civic space remains on D7.2.
Consider formal and informal connectivity of civic spaces. (Neighborhood meeting feedback)	Connectivity and linkages between civic spaces were a significant driver in the open space plan.
Civic Space Types, Programming, and Design	
The community should be involved in the civic space type selection (Neighborhood meeting feedback).	In response to the expressed desire for significant community involvement in the type and character of each space, the development team has opted to defer the designation of the civic space type for civic space parcels that have type flexibility until the site plan review stage, thus giving opportunity for the community as well as the specific building design to drive the design and character of the space.
Civic spaces should serve a diverse range of ages from small children to the elderly.	The civic space plan will include a variety of different space types and locations (east central, south, northwest) that can serve a variety of users needs.
Spaces for seniors should be considered as that populations is expected to grow.	The civic space plan will include a civic space on D7.2 and will provide a pedestrian connection to the adjacent senior and young disabled housing building as well as Bow St.
Civic space needs of the largest groups ages 25-29 and ages 30-34 should be considered.	This demographic as well as others will be queried when civic spaces are programmed and designed during design and site plan review.
Resident and workers in the study are least served by pocket parks and greens, neighborhood meeting feedback focused on more green.	Several of the proposed civic spaces, D7.2 and D2.4 in particular, could be designated for the "greener" civic space types, a green or pocket park instead of plaza civic space types.
Athletic fields are a need (neighborhood meeting feedback).	Unfortunately, none of the civic spaces on the D Blocks are large enough to fulfill this need.
Community gardens remain a need (neighborhood meeting feedback).	The Concord Community Garden will be preserved on D4.3.

FINDING	CDP OPEN SPACE PLAN INFLUENCE
Integrate arts and performance opportunities into the spaces (neighborhood meeting feedback).	Given the unique character of Union Square and the art focused input of residents, the design and programing of the civic spaces will seek to integrate arts and performance opportunities. This may be through the design of the spaces themselves, defined areas for art or performance, or adjacencies to art and cultural uses.
Incorporate sustainable design (neighborhood meeting feedback).	Ecological benefits and sustainable design measures will be included in the design of all of the civic spaces. The urban tree canopy will be enhanced through the planting of abundant shade trees planted with sufficient soil mass to ensure long term viability. A very high percentage of the surface area of each space will either be planted or permeable paving for passive storm water management. Light colored paving will be used in paved areas for solar reflectively and pedestrian lighting will be predominantly LED. Additionally, pedestrian and cycling will be encouraged with wide walkways and substantial bicycle parking. The plant palette will be diverse and will include the opportunity for community garden spaces.

Overall, significant consideration was given to community interests and needs in the design of the civic space plan. Additionally, the CDP will provide the ground work for the future design of high quality open spaces based upon detailed research of existing conditions and community input. The future design and site plan review stages will give the opportunity for the community members to engage in more depth on the programming and design of each of the individual spaces to a well-loved, vibrant and dynamic open spaces to Union Square.

Transportation

Appendix D1

Excerpt from Appendix B of the Union Square Neighborhood Plan

TDM Measure	Cost Estimates- Planning Level (Cost in US Dollars unless noted)	Traffic/ Parking / Mode Split Benefit	Cost/ Benefit
	(depending on subsidy discount rate, generally 50%-60% of a full price monthly transit pass for full time employees)		

2 PARKING GENERATION

This technical memorandum provides a brief overview of the process and analysis methodology to model weekday parking demand in Union Square, as well as results and strategic recommendations.

Overall, the modeled demand is higher than the parking provided in the Neighborhood Plan build-out plan. Regardless, in order to properly manage parking, there are several measures to take that are recommended for the City, building managers, and developers alike.

APPROACH

Typically, in mixed use developments, customers and visitors can visit multiple destinations, though only park once. Moreover, throughout the day, different uses have different peak demands: for example, an office may have a high demand until 5pm, and a restaurant open for dinner may have a high demand only after 5pm.

Union Square, in total, acts like a large mixed-use development, where each land use or building would not require its own dedicated supply of parking. However, traditional analysis and zoning are typically based on such assumptions. In fact, an analysis of current parking demand in Union Square showed that only about **65% of existing spaces** are utilized at the highest observed period of demand (counts taken in September 2015).

When modeling expected parking demand for the proposed buildout of Union Square, the team's parking model includes localized, targeted adjustments that account for the nature of mixed-use developments as well as context-specific factors in Union Square.

MODEL ANALYSIS AND RESULTS

The Institute of Transportation Engineers (ITE) produces a report titled *Parking Generation*, which is the prevailing national standard in determining parking demand for a development. ITE standards are based on parking demand studies submitted to ITE by a variety of parties, including public agencies, developers and consulting firms. ITE parking rates often do not reflect the actual demand profile of mixed use areas.

Based on Union Square's mixed use and accessible context, Nelson\Nygaard used an adapted shared parking model based on Urban Land Institute's (ULI) Shared Parking Manual (2nd

Edition, 2005), and ITE's Parking Generation (4th Edition, 2010) to model demand. This model accounts for the sharing of uses over the course of a day, as shown in Figure 1 below.

Moreover, Union Square is located in a walkable, bikeable, transit-rich environment. The MBTA's Green Line extension will certainly improve access by other modes and further reduce expected parking demand. The proposed buildout of Union Square will also include extensive Transportation Demand Management measures to encourage employees and visitors alike to visit the site using non-drive alone modes. Therefore, a traditional parking demand analysis is not appropriate for this context.

Thus, the expected parking demand model is tailored to include the following inputs:

- Land use in Union Square
- Shared use by time of day
- Context variables, including:
  - Mode shares in Union Square
  - Internal capture (trips that access multiple uses without generating additional parking demand, i.e. walking from a residence to a coffee shop, or from the office to a restaurant)
  - TDM program impacts

The following describes these adjustments in detail.

Demand by Land Use

The parking model starts with the assumed program: land use square footage and number of units provided by the USQ team Table 5.

Table 5 Union Square Proposed Program Summary

Use	D Parcels	Boynton Yards	Milk Square	Scattered Sites
Apartments	533	1,030	566	220
Hotel Rooms	175	0	0	0
Retail (SF)	n/a	n/a	115,275	n/a
Office (SF)	624,900	1,808,894	987,726	170,000

Nelson\Nygaard then applied the rates in Table 6 to create a baseline demand in the shared parking model. Where available from ITE, urban parking generation rates are used (Supermarket and Low/Mid-Rise Apartment). TDM is not assumed in urban rates.

Table 6 ITE Codes and Rates

ITE Code (4th Gen)	ITE Code Description	Project Land Use	Weekday Rate	Units
820	Shopping Center (non-Friday weekday, non-December)	General Retail	2.55	1,000 SF

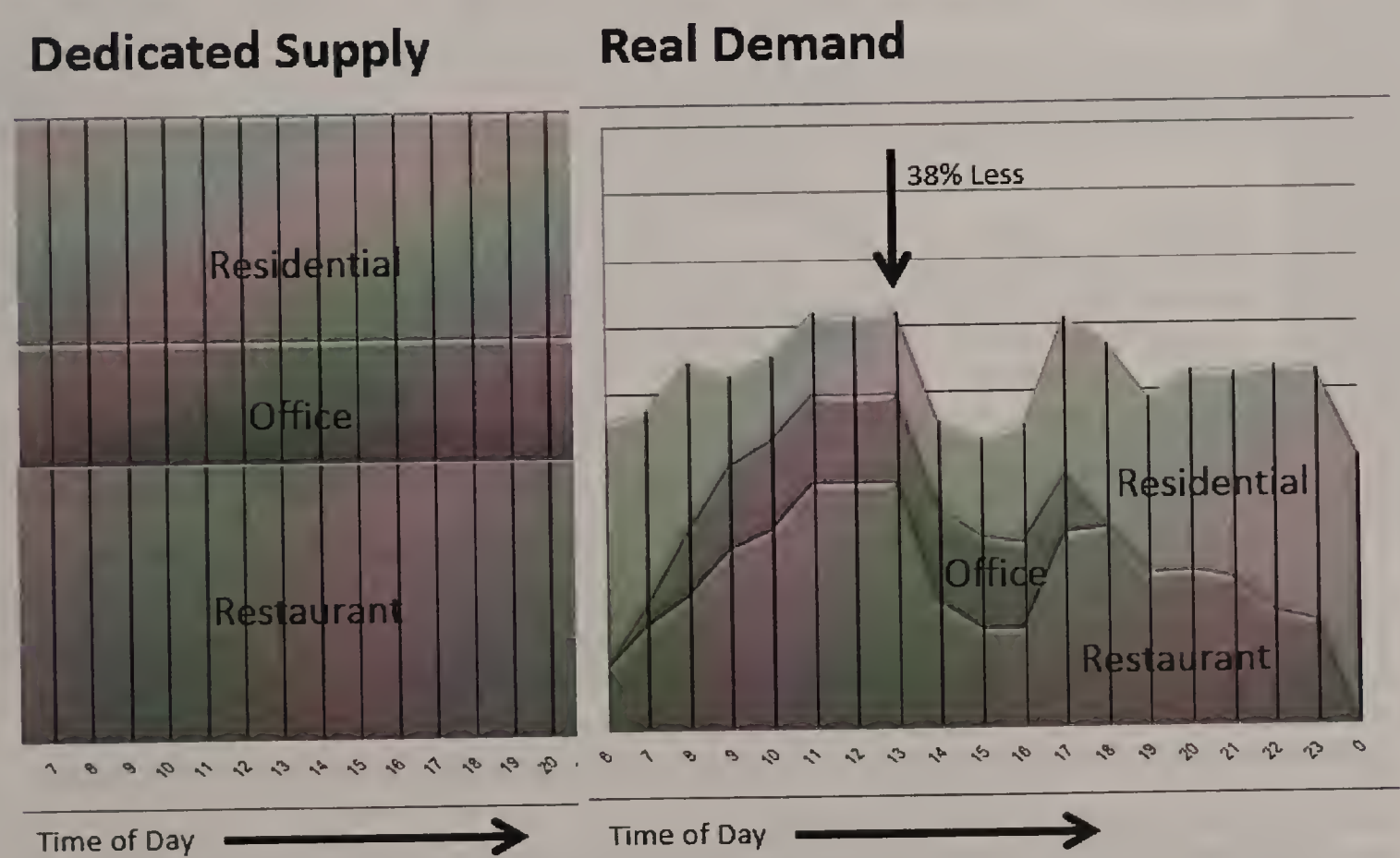
221	Low/Mid-Rise Apartment, Urban	Apartments	1.20	Unit
310	Hotel (Weekday parking demand for five urban study sites, included in Database Description)	Hotel	0.64	Occupied Room[6]
201	Office, Urban	Office	2.47	1,000 SF

Reductions for Demand by Time of Day

Parking demand peaks at different land uses at different times of day. For example, the spaces at a bank are available after close of business (typically 5pm), while those at a residential property may be unused in the middle of the day if residents drive to work. Publically available, or shared private, spaces can therefore serve multiple trips for one user and/or multiple users to different uses.

The Shared Parking Model thus includes parking demand fluctuations at different times of day by land use. These time of day reductions are reviewed initially and occur absent any other parking or travel demand management policies, and usually reduce modeled demand compared to a dedicated supply for each land use (Figure 1).

Figure 1 Example Parking Requirements vs. Real Demand



[6] For the purposes of this study and to create a conservative estimate, all rooms were considered occupied.

Contextual and Environmental Reductions

The Union Square Shared Parking Model adjusts ITE rates based on several factors. These factors were uniquely identified based on Union Square context, shown in Table 8. Factors are applied in different combinations by land use, as outlined in the next section.

An overall parking utilization study was completed in Union Square to understand current parking demand. The observed parking was compared to the existing land use, and calculations showing actual parking demand, rather than modeled, were completed and shown below. The results were used to help benchmark demand calculations and were further compared to other national examples where similar data was available.. The results showed an extremely low demand, as shown in Table 7, even for current Union Square conditions.

Table 7 Parking Demand in American Cities

City/Town	Occupied Square Footage	% Office	% Residential	% Commercial /Retail	% Other	Peak Demand	Weekday Peak	Peak Demand Ratio (per KSF)
St. Paul, MN*	29,000,000	57%	31%	5%	8%	19,170	Midday	0.66
Salem	4,500,000	52%	19%	29%	0%	3,842	10:00 AM	0.86
Savannah, GA	17,200,000	15%	56%	19%	9%	16272	3:00 PM	0.95
Portsmouth, NH*	2,800,000	26%	22%	37%	15%	3,371	12:00 PM	1.18
Santa Monica	4,400,000	Not available				6,900	1:00 PM	1.57
Union Square	3,300,000	12%	57%	16%	15%	2,045	12:00 PM	0.61

Moreover, the land uses are expected to change dramatically with the addition of almost 6 million square feet of build-out. Therefore, while traditional practice is to calibrate the shared parking model with on-the-ground demand, the team took a conservative approach and adjusted down from ITE using context variables shown in Table 8. We note that this approach results in a more conservative (higher) expected parking demand rate than is currently observed in Union Square.

Table 8 Contextual Reductions in Parking Demand

Reduction	% Reduction	Source	Union Square Context
Captive Market Effect: Commercial	32%	Internal capture rates for commercial land uses reported a 32% average reduction.	Union Square has an excellent mix of uses, ranging from retail to office to residential. This

		(Trip Generation Handbook, 2nd Edition. ITE pg. 129 - Districtwide Trip Generation Study, Florida Department of Transportation, District IV, March 1995)	will only improve in the future. Thus, this model input set internal capture to the maximum.
Captive Market Effect: Residential	31%	Internal capture rates from various mixed-use studies –> 11% - 50% residential internal capture observed –> 31% - average residential internal capture (Trip Generation Handbook, 2nd Edition. ITE pg. 129 - Districtwide Trip Generation Study, Florida Department of Transportation, District IV, March 1995)	
Employee TDM Impact	24%	Transportation demand management effectiveness reducing # of commuter vehicles (Trip Generation Handbook, Second Edition. Appendix B - Page 123)	Union Square's accessibility by a mix of modes currently serves as excellent TDM for employees and residents alike. This will only improve in the future – thus the model set this input to the maximum.
Residential TDM Impact	30%	Unbundling the cost of parking from residential property sales/lease cost reduces household vehicle ownership by up to 30% (VTPI Parking Management. (2009))	Living in Union Square does not guarantee one a dedicated parking space. This has been shown to reduce parking demand by residents. The study recommends that future developments "unbundle" parking as a TDM as well as cost-mitigation mechanism.
Transit Access Impact on Retail	0 - 8%	Shopping centers with access to transit services appeared to have lower peak parking demand than those sites without transit service. Range from 1-8% (ITE Parking Generation, 4th ed. P. 227)	Union Square is currently well-served by MBTA bus service and will have high-quality Green Line service. Therefore, this input is set to the maximum.
Residential Mode Adjustment	0% - 30%	Adjustments as low as 50% appear to be appropriate for urban CBD locations. 20% reflects auto ownership in areas that are not downtown but are well served by transit (ULI Shared Parking, Second Edition p.88)	Commute share for residents of Union Square was slightly higher than those commuting to Union Square. Thus the team modeled this in a range.
Office Employee Mode Adjustment	25% - 40%	A mode adjustment of 0.3 to 0.6 is appropriate for downtown office space in areas with paid parking and high-quality transit service (ULI Shared Parking, Second Edition, p.91)	In the future, Union Square will have both paid parking and high-quality transit service. The team used a range for this input.
Employee Parking Share (non-office)	20%	Average share of peak parking demand consumed by employees. (The True Cost of Free Parking. Shoup, Donald. Pg. 86)	Employees respond differently to transportation context changes as they commute in similar patterns daily. Thus it is important to distinguish this group from customers at non-office uses. This was assumed to be consistent across uses.
Office Visitor Parking Share	0 – 4%	Visitor parking accounts for 7-8% of office parking on a per space basis (ULI Shared Parking, Second Edition, p.91)	Visitor parking demand at offices is similarly broken out by the model as influenced by different factors than regular commuters. As the proportion of visitors to different offices varies (i.e. the difference between a call center and a lawyer who sees clients) this number was varied across scenarios.

Note that while the model applies several reductions for Union Square's transit-rich, walkable context, it is still conservative in its estimates. For example, office employee mode share reduction may be as low as 70%, while the model assumed 25-35%.Residential mode share reductions can be as high as 50%, while the model assumed 0-30%.

Modeling Demand by Use

The following section outlines the inputs that affect the parking demand generated by each use. These inputs are generally in the form of reductions for certain or all user groups. Each reduction is applied to the flat line demand generated by ITE-based numbers.

As noted above, the Shared Parking Model includes these reduced rates **plus parking demand fluctuations at different times of day by land use.** Different land uses peak at different times, and the model combines demand across the day to determine an overall peak for the mix of uses.

Each cluster is modeled separately and the results combined, which assumes that parking is shared in each cluster but not across clusters. In reality, parking may be shared across clusters as well.

Retail Uses Peak Demand

For retail uses, the City is following the same policy being used in North Point for retail and restaurant parking. For planning purposes, retail and restaurant parking demand will be accommodated by the on street parking included throughout the new development, but not off-street parking. The exception to this is retail provided at the Target site.

Traditional Peak Parking Demand Ratio: 2.55

Source: ITE *Parking Generation*, 4th Edition (820)

Reduction Factors Applied:

Reduction	% Reduction	Source	Union Square Context
Captive Market Effect: Commercial	32%	Internal capture rates for commercial land uses reported a 32% average reduction. (Trip Generation Handbook, 2nd Edition. ITE pg. 129 - Districtwide Trip Generation Study, Florida Department of Transportation, District IV, March 1995)	Union Square has an excellent mix of uses, ranging from retail to office to residential. This will only improve in the future. Thus, this model input set internal capture to the maximum.
Transit Access Impact on Retail	0 - 8%	Shopping centers with access to transit services appeared to have lower peak parking demand than those sites without transit service. Range from 1-8% (ITE Parking Generation, 4th ed. P. 227)	Union Square is currently well-served by MBTA bus service and will have high-quality Green Line service. Therefore, this input is set to the maximum.
Employee TDM Impact	24%	Transportation demand management effectiveness reducing # of commuter vehicles (Trip Generation Handbook, Second Edition. Appendix B - Page 123)	Union Square's accessibility by a mix of modes currently serves as excellent TDM for employees and residents alike. This will only improve in the future – thus the model set this input to the maximum.
Employee Parking Share (non-office)	20%	Average share of peak parking demand consumed by employees. (The True Cost of Free Parking. Shoup, Donald. Pg. 86)	Employees respond differently to transportation context changes as they commute in similar patterns daily. Thus it is important to distinguish this group from customers at non-office uses. This was assumed to be consistent across uses.

The following equation is used to calculate peak parking demand for retail uses:

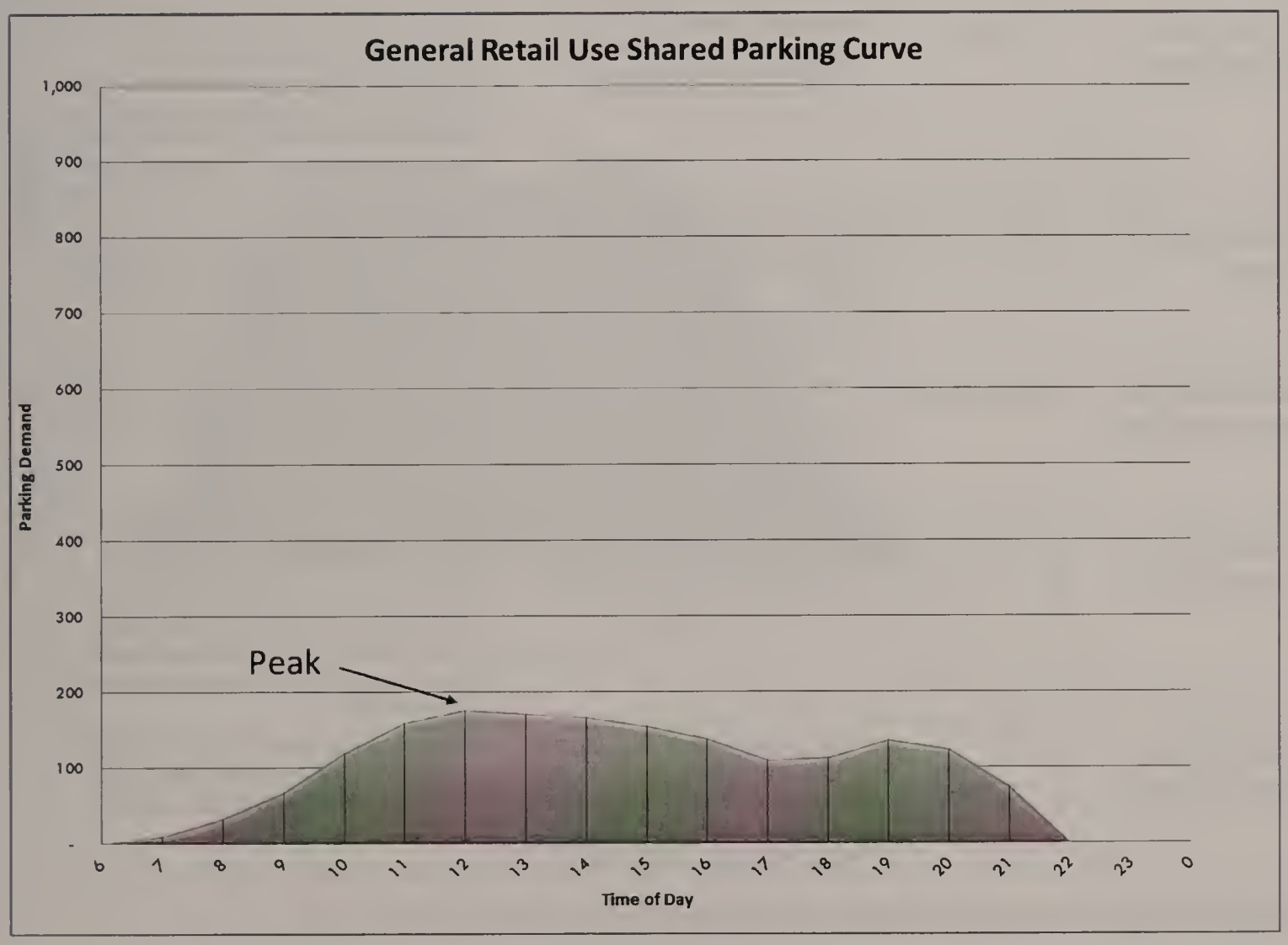
$$(1 - Captive\ Market\ Effect) * (1 - Transit\ Access\ Impact\ on\ Retail\ Demand) * \big((1 - Employee\ TDM\ Impact) * Employee\ Parking\ Share * ITE\ Parking\ Demand + (1 - Employee\ Parking\ Share) * ITE\ Parking\ Demand\big)$$

Or:

$$(1 - 0.32) * (1 - 0.08) * \big((1 - 0.24) * 0.2 * 2.55 + (1 - 0.2) * 2.55\big)$$

The equation can be broken down into three parts. Part 1 accounts for transit access and the captive market effect; this is applied to all retail demand. Part 2 is the employee parking demand, and includes reductions from TDM programming. Part 3 is a calculation of non-employee demand.

Demand by time of day for retail is shown below, based on the retail program modeled for Milk Square:



Office Uses Peak Demand

Traditional Peak Parking Demand Ratio 2.47

Source: ITE *Parking Generation*, 4th Edition (701, urban rate)

Reduction Factors Applied:

Reduction	% Reduction	Source	Union Square Context
Captive Market Effect: Commercial	32%	Internal capture rates for commercial land uses reported a 32% average reduction. (Trip Generation Handbook, 2nd Edition. ITE pg. 129 - Districtwide Trip Generation Study, Florida Department of Transportation, District IV, March 1995)	Union Square has an excellent mix of uses, ranging from retail to office to residential. This will only improve in the future. Thus, this model input set internal capture to the maximum.
Office Visitor Parking Share	0 – 4%	Visitor parking accounts for 7-8% of office parking on a per space basis (ULI Shared Parking, Second Edition, p.91)	Visitor parking demand at offices is similarly broken out by the model as influenced by different factors than regular commuters. As the proportion of visitors to different offices varies (i.e. the difference between a call center and a lawyer who sees clients) this number was varied across scenarios.
Employee TDM Impact	24%	Transportation demand management effectiveness reducing # of commuter vehicles (Trip Generation Handbook, Second Edition. Appendix B - Page 123)	Union Square's accessibility by a mix of modes currently serves as excellent TDM for employees and residents alike. This will only improve in the future – thus the model set this input to the maximum.
Office Employee Mode Adjustment	25% - 40%	A mode adjustment of 0.3 to 0.6 is appropriate for downtown office space in areas with paid parking and high-quality transit service (ULI Shared Parking, Second Edition, p.91)	In the future, Union Square will have both paid parking and high-quality transit service. The team used a range for this input.
Office Visitor Parking Share	0 – 4%	Visitor parking accounts for 7-8% of office parking on a per space basis (ULI Shared Parking, Second Edition, p.91)	Visitor parking demand at offices is similarly broken out by the model as influenced by different factors than regular commuters. As the proportion of visitors to different offices varies (i.e. the difference between a call center and a lawyer who sees clients) this number was varied across scenarios.
Transit Access Impact on Retail	0 - 8%	Shopping centers with access to transit services appeared to have lower peak parking demand than those sites without transit service. Range from 1-8% (ITE Parking Generation, 4th ed. P. 227)	Union Square is currently well-served by MBTA bus service and will have high-quality Green Line service. Therefore, this input is set to the maximum.

The following equation is used to calculate peak parking demand for office uses:

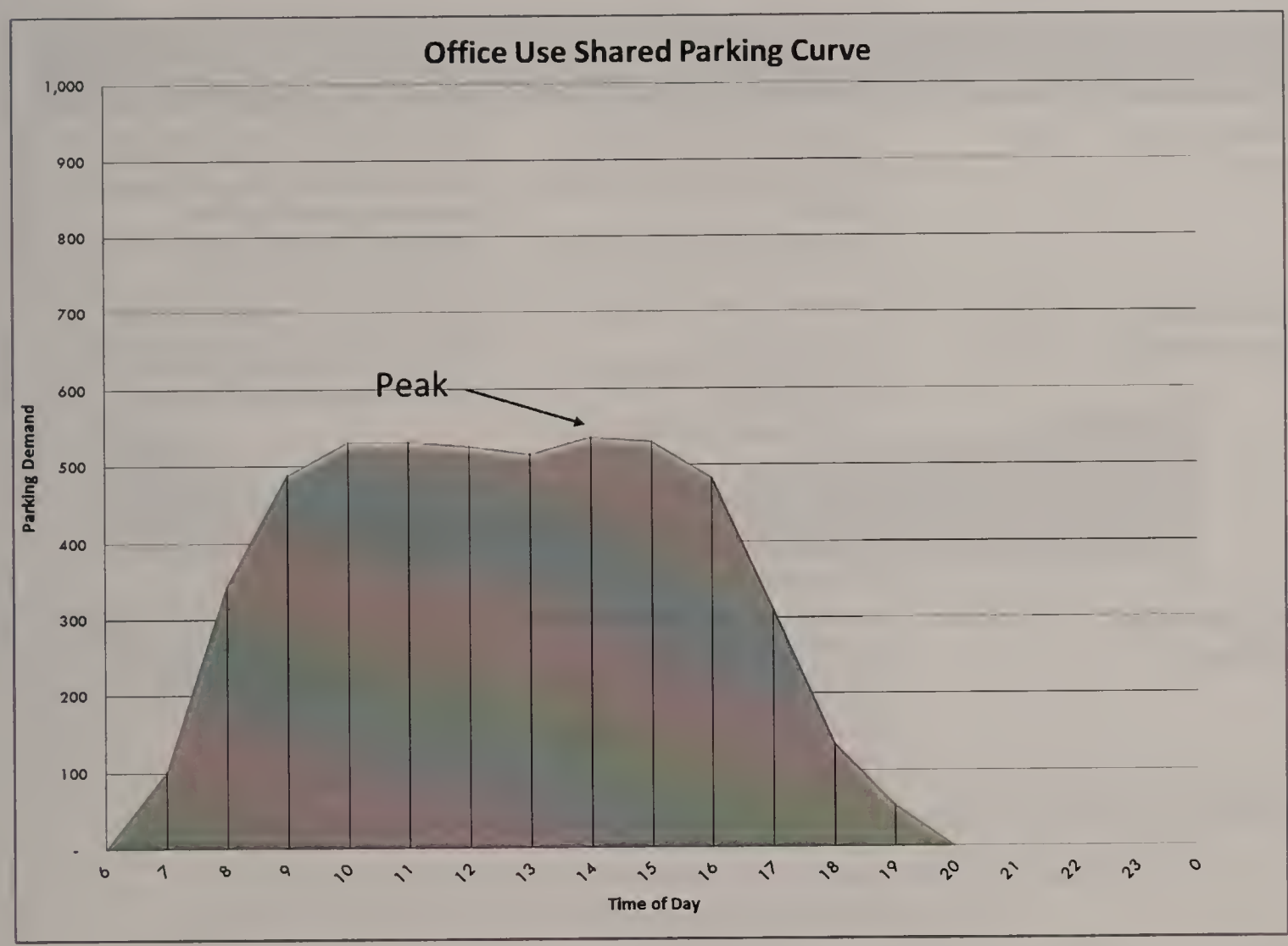
$$(1 - Captive\ Market\ Effect) * \big((1 - Office\ Visitor\ Parking\ Share) * (1 - Employee\ TDM\ Impact) * (1 - Office\ Employee\ Mode\ Adjustment) * ITE\ Parking\ Demand\big) + Office\ Visitor\ Parking\ Share * (1 - Captive\ Market\ Effect) * (1 - Transit\ Access\ Impact\ on\ Retail\ Demand) * ITE\ Parking\ Demand$$

Or (numbers shown below are for the more aggressive estimate, or lower parking demand):

$$(1 - 0.32) * \big((1 - 0.04) * (1 - 0.24) * (1 - 0.40) * 2.47\big) + 0.04 * (1 - 0.32) * (1 - 0.08) * 2.47$$

The equation can be broken down into two parts. Part 1 accounts for the captive market effect on employees only, as well as the Employee TDM Impacts and Office Employee Mode Adjustments. Part 2 applies the captive market effect and transit access impact on retail demand to the non-employee visitors, who are assumed to behave much like visitors of retail establishments.

Demand by time of day for office is shown below, based on the program modeled for the D parcels.



Residential Uses Peak Demand

Traditional Peak Parking Demand Ratio — 1.1 per unit

Source: — ITE *Parking Generation*, 4th Edition (221, lower bound of 95% confidence interval to account for retail analysis showing low parking demand)

Reduction Factors Applied:

Reduction	% Reduction	Source	Union Square Context
Residential TDM Impact	30%	Unbundling the cost of parking from residential property sales/lease cost reduces household vehicle ownership by up to 30% (VTPI Parking Management. (2009))	Living in Union Square does not guarantee one a dedicated parking space. This has been shown to reduce parking demand by residents. The study recommends that future developments "unbundle" parking as a TDM as well as cost-mitigation mechanism.
Captive Market Effect: Residential	31%	Internal capture rates from various mixed-use studies –> 11% - 50% residential internal capture observed –> 31% - average residential internal capture (Trip Generation Handbook, 2nd Edition. ITE pg. 129 - Districtwide Trip Generation Study, Florida Department of Transportation, District IV, March 1995)	Union Square has an excellent mix of uses, ranging from retail to office to residential. This will only improve in the future. Thus, this model input set internal capture to the maximum.
Residential Mode Adjustment	0% - 30%	Adjustments as low as 50% appear to be appropriate for urban CBD locations. 20% reflects auto ownership in areas that are not downtown but are well served by transit (ULI Shared Parking, Second Edition p.88)	Commute share for residents of Union Square was slightly higher than those commuting to Union Square. Thus the team modeled this in a range.

The following equation is used to calculate peak parking demand for residential uses:

$$(1 - Residential\ TDM\ Impact) * (1 - Residential\ Captive\ Market\ Effect) * (1 - Residential\ Mode\ Adjustment) * ITE\ Parking\ Demand$$

Or (numbers shown below are for the more aggressive estimate, or lower parking demand):

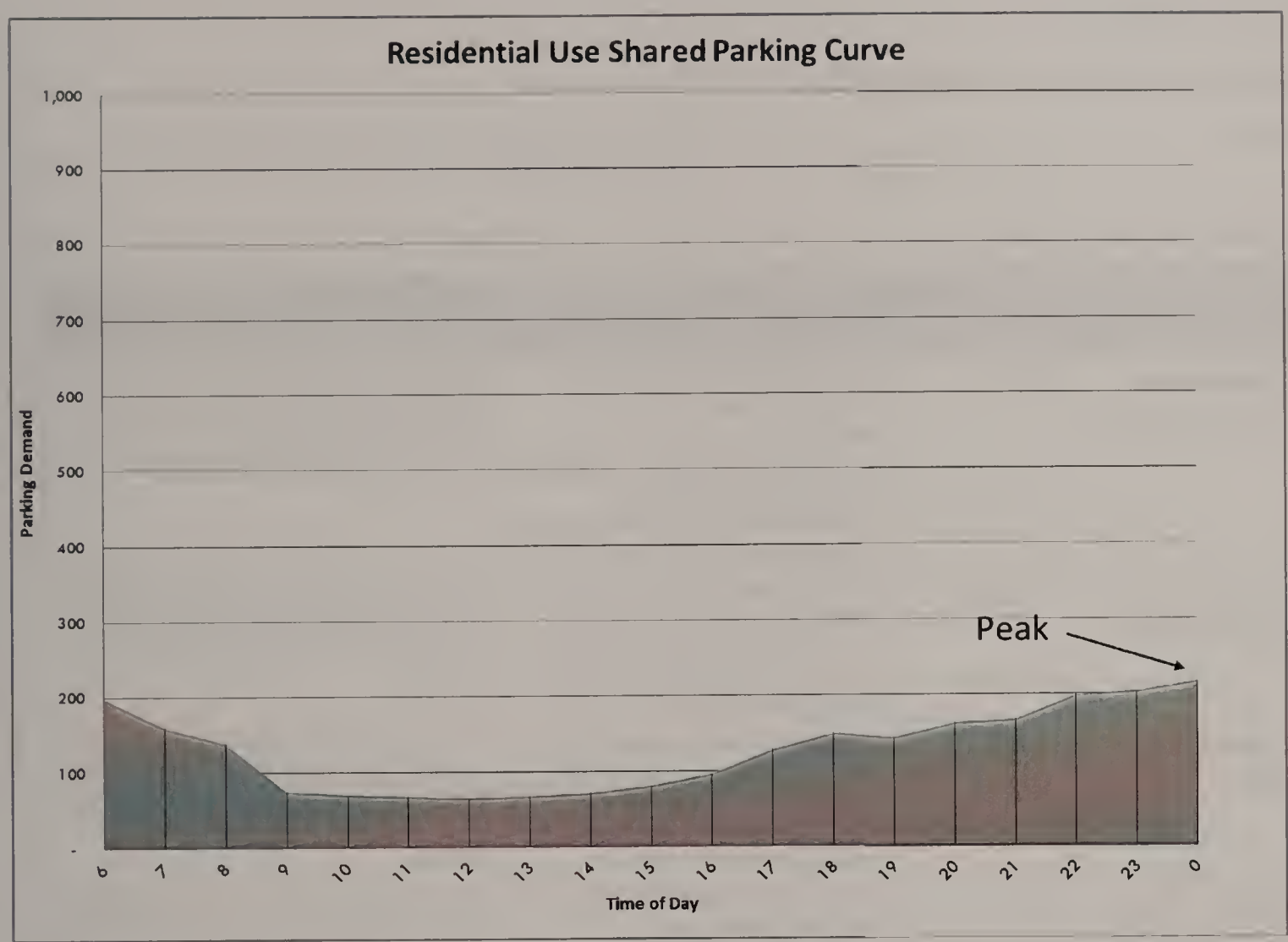
$$(1 - 0.30) * (1 - 0.31) * (1 - 0.30) * 1.1$$

Where variables are as defined above as well as:

This equation is more straightforward and assumes that residents behave similarly to their visitors.

It is worth noting that the lower bound of this analysis (higher reduction factors) produces a final peak demand ratio of 0.37, which is similar to that proposed by the US2 design team (0.3 parked cars/unit).

Demand by time of day for retail is shown below, based on the program modeled for the D parcels.


Residential Use Shared Parking Curve
1,000
900
800
700
600
500
400
300
200
100
-
Parking Demand
Peak
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
0
Time of Day

Hotel Peak Demand

Traditional Peak Parking Demand Ratio — 0.6 per room

Source: — ITE *Parking Generation*, 4th Edition (312, business hotel)

Reduction Factors Applied:

Reduction	% Reduction	Source	Union Square Context
Captive Market Effect: Commercial	32%	Internal capture rates for commercial land uses reported a 32% average reduction. (Trip Generation Handbook, 2nd Edition. ITE pg. 129 - Districtwide Trip Generation Study, Florida Department of Transportation, District IV, March 1995)	Union Square has an excellent mix of uses, ranging from retail to office to residential. This will only improve in the future. Thus, this model input set internal capture to the maximum.
Transit Access Impact on Retail	0 - 8%	Shopping centers with access to transit services appeared to have lower peak parking demand than those sites without transit service. Range from 1-8% (ITE Parking Generation, 4th ed. P. 227)	Union Square is currently well-served by MBTA bus service and will have high-quality Green Line service. Therefore, this input is set to the maximum.
Employee TDM Impact	24%	Transportation demand management effectiveness reducing # of commuter vehicles (Trip Generation Handbook, Second Edition. Appendix B - Page 123)	Union Square's accessibility by a mix of modes currently serves as excellent TDM for employees and residents alike. This will only improve in the future – thus the model set this input to the maximum.
Employee Parking Share (non-office)	20%	Average share of peak parking demand consumed by employees. (The True Cost of Free Parking. Shoup, Donald. Pg. 86)	Employees respond differently to transportation context changes as they commute in similar patterns daily. Thus it is important to distinguish this group from customers at non-office uses. This was assumed to be consistent across uses.

The following equation is used to calculate peak parking demand for office uses:

$$(1 - Captive\ Market\ Effect) * (1 - Transit\ Access\ Impact\ on\ Retail) * ((1 - Employee\ TDM\ Impact) * Employee\ Parking\ Share * * ITE\ Parking\ Demand + (1 - Employee\ Parking\ Share) * ITE\ Parking\ Demand)$$

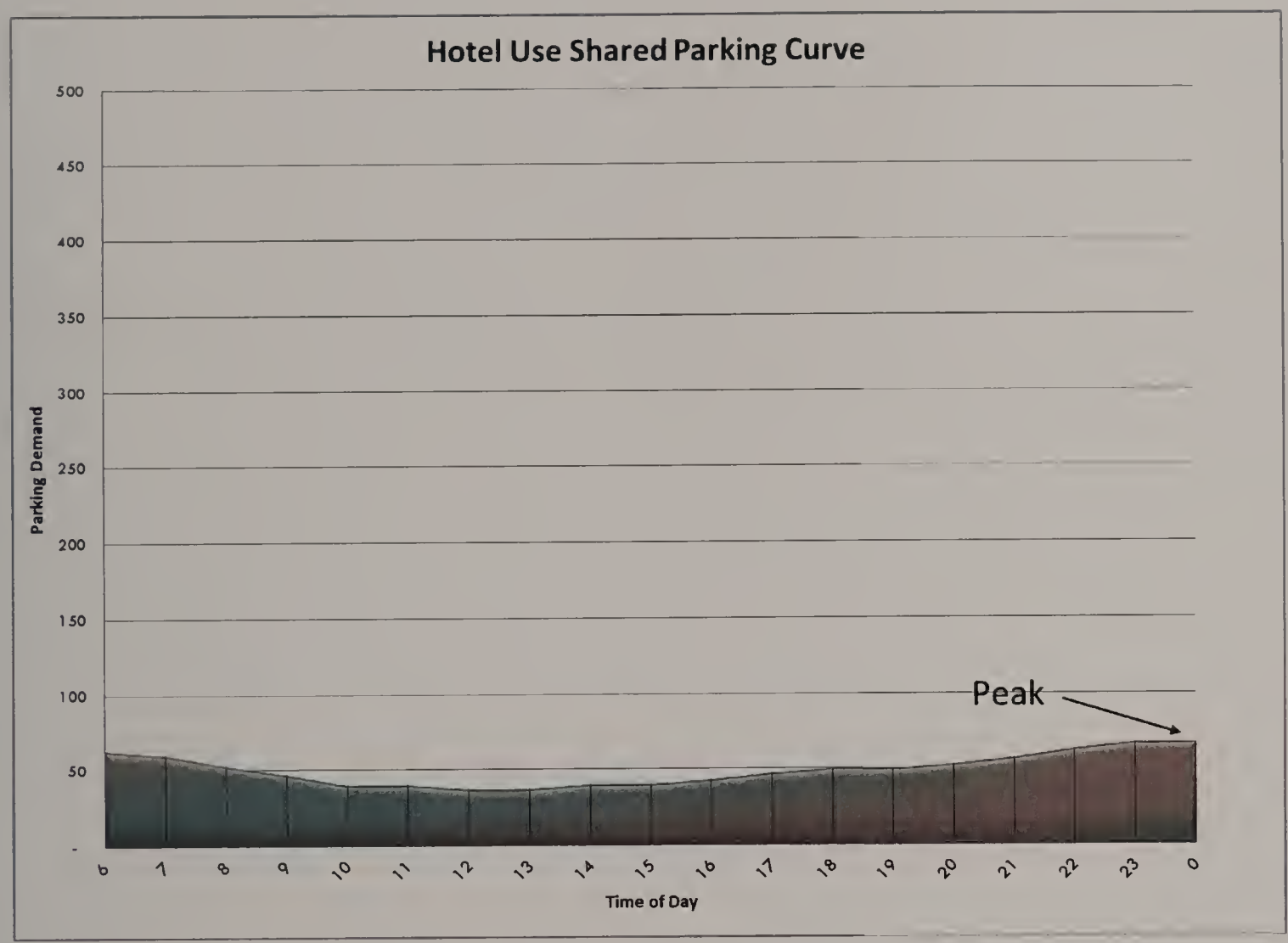
Or:

$$(1 - 0.32) * (1 - 0.08) * ((1 - 0.24) * 0.20 * 0.6 + (1 - 0.20) * 0.6)$$

Where variables are as defined above.

The equation can be broken down into three parts. Part 1 accounts for captive market effect as well as transit access which is applied to both employee and visitor demand. Part 2 is the employee parking demand, and includes reductions from TDM programming. Part 3 is a calculation of non-employee demand.

Demand by time of day for hotel is shown below, based on the program modeled for the D parcels.



Outcomes

The study team modeled four clusters independently. Peaks for these clusters may vary, thus considering all uses together may result in slightly different peak demand than the simple sum of all peaks. However, a conservative total estimate for peak demand as a sum of the individual cluster peaks is noted in Table 9, below.

Table 9 Parking Modeling Results

Cluster	Total GSF	Total Residential	Total Office	Retail	Hotel	Peak Demand	
		Units	GSF	GSF	Keys	Low	High
D Parcels	1,451,425	533	624,900	n/a	175	613	750
Boynton	3,136,742	1,030	1,808,894	n/a		1,582	1,935
Milk Sq	1,796,740	566	987,726	115,275		1,029	1,235
Scattered Sites		220	170,000	n/a		167	208
Total						3,391	4,128

Appendix D2

Assumptions Included in the Share Parking Model

Parking Plan

The Union Square Redevelopment seeks to provide parking that serves the proposed development and adjacent neighborhood without incentivizing driving, and is as efficiently utilized as possible in order to meet the goals of the Union Square Neighborhood Plan. To that end, management principles for parking at the redevelopment sites include:

- **The uses in the Union Square Redevelopment will share parking to the greatest extent possible**, including between buildings. This recognizes that Union Square is a mixed use development where, for example, one parking space can serve someone who is working in an office during the day and visiting a restaurant at night.
- **Parking will generally be "unbundled,"** i.e. sold separately from any lease or sale of another use within the development. This approach makes the cost of parking visible to the potential user, and gives them the opportunity to go without.
- **Parking will be built in phases** with the project. This will help the development team monitor use and adjust management accordingly.
- **Dedicated parking will be limited.** In accordance with recently adapted zoning, reserved parking will be limited to encourage the efficient use of all parking spaces.

Total Demand Estimate

Estimates of parking demand used the detailed model developed specifically for Union Square as part of the Union Square Neighborhood Plan. [1] Based on Union Square's mixed use and accessible context, the team used an adapted shared parking model based on Urban Land Institute's (ULI) Shared Parking Manual (2nd Edition, 2005), and the Institute for Transportation Engineers (ITE)'s Parking Generation (4th Edition, 2010) to model demand. This model accounts for the sharing of uses over the course of a day.

The estimated peak demand for the Union Square development is approximately 1,454 vehicles at midday. This is an *estimate* based on a model that is described in detail below.

Estimates of parking demand used the detailed model developed specifically for Union Square as part of the Union Square Neighborhood Plan. [2]Based on Union Square's mixed use and accessible context, the team used an adapted shared parking model based on Urban Land Institute's (ULI) Shared Parking Manual (2nd Edition, 2005), and the Institute for Transportation Engineers (ITE)'s Parking Generation (4th Edition, 2010) to model demand. This model accounts for the sharing of uses over the course of a day. The model is based on the most current program as outlined below:

Table 1 Program Summary

Use	Size
Retail	140,000 sq ft
Arts and Creative Enterprise	74,800 sq ft*
Office / Lab	1,154,000 sq ft

[2] See Union Square Neighborhood Plan, Appendix B.

Hotel	175 rooms
Apartments	1,000 units

* Approximately 22,000 ft of arts and creative enterprise space is live/work and captured in the residential unit count. To avoid double-counting, the parking model accounts for the demand generated by approximately 53,000 square feet of arts and creative enterprise.

Specifically, the parking demand model includes the following inputs:

- Land use in Union Square
- Shared use by time of day
- Context variables, including:
  - Mode shares in Union Square
  - Internal capture (trips that access multiple uses without generating additional parking demand, i.e. walking from a residence to a coffee shop, or from the office to a restaurant)
  - TDM program impacts

The model assumes the following reductions, shown in Table 2:

Table 2 Contextual Reductions in Parking Demand

Reduction	% Reduction	Source	Union Square Context
Captive Market Effect: Commercial	32%	Internal capture rates for commercial land uses reported a 32% average reduction. (Trip Generation Handbook, 2nd Edition. ITE pg. 129 - Districtwide Trip Generation Study, Florida Department of Transportation, District IV, March 1995)	Union Square has an excellent mix of uses, ranging from retail to office to residential. This will only improve in the future. Thus, this model input set internal capture to the maximum.
Captive Market Effect: Residential	31%	Internal capture rates from various mixed-use studies --> 11% - 50% residential internal capture observed --> 31% - average residential internal capture (Trip Generation Handbook, 2nd Edition. ITE pg. 129 - Districtwide Trip Generation Study, Florida Department of Transportation, District IV, March 1995)	
Employee TDM Impact	24%	Transportation demand management effectiveness reducing # of commuter vehicles (Trip Generation Handbook, Second Edition. Appendix B - Page 123)	Union Square's accessibility by a mix of modes currently serves as excellent TDM for employees and residents alike. This will only improve in the future – thus the model set this input to the maximum.
Residential TDM Impact	30%	Unbundling the cost of parking from residential property sales/lease cost reduces household vehicle ownership by up to 30% (VTPI Parking Management. (2009))	Living in Union Square does not guarantee one a dedicated parking space. This has been shown to reduce parking demand by residents. The study recommends that future developments "unbundle" parking as a TDM as well as cost-mitigation mechanism.
Transit Access Impact on Retail	8%	Shopping centers with access to transit services appeared to have lower peak parking demand than those sites without	Union Square is currently well-served by MBTA bus service and will have high-quality Green Line service. Therefore, this input is set to the maximum.

		transit service. Range from 1-8% (ITE Parking Generation, 4th ed. P. 227)	
Office Employee Mode Adjustment	35%	A mode adjustment of 0.3 to 0.6 is appropriate for downtown office space in areas with paid parking and high-quality transit service (ULI Shared Parking, Second Edition, p.91)	In the future, Union Square will have both paid parking and high-quality transit service. The team used a range for this input.
Employee Parking Share (non-office)	20%	Average share of peak parking demand consumed by employees. (The True Cost of Free Parking. Shoup, Donald. Pg. 86)	Employees respond differently to transportation context changes as they commute in similar patterns daily. Thus it is important to distinguish this group from customers at non-office uses. This was assumed to be consistent across uses.
Office Visitor Parking Share	4%	Visitor parking accounts for 7-8% of office parking on a per space basis (ULI Shared Parking, Second Edition, p.91)	Visitor parking demand at offices is similarly broken out by the model as influenced by different factors than regular commuters. As the proportion of visitors to different offices varies (i.e. the difference between a call center and a lawyer who sees clients) this number was varied across scenarios.

Demand Estimates by Use

- **Employee:** The model assumes that at peak, the parking demand for employees at the office use will be 995 vehicles at midday. There will be additional parking for retail employees, which is assumed to be approximately 20% of peak parking demand for the hotel and retail, or a peak of approximately 50 employees at midday.
- **Resident:** Residential peak demand would occur at midnight, with approximately 570 parked vehicles.
- **Short- and Long-Term Visitor Parking Demand:** This demand is included in the parking generation rates by use. We note further that any proposed retail space will be primarily local servicing with limited demand or use of parking facilities.

These modeled results are close to what is happening on the ground today. As described in the CDSP, the Neighborhood Plan included a comprehensive study of parking inventory and utilization in the study area. This was compared to existing land uses in the Square. The team identified a peak parking demand ratio of 0.61 spaces per 1,000 square feet in Union Square. This proposed total of 1,500 spaces for 2.4 million square feet is providing parking at a similar rate (0.63 spaces per 1,000 square feet). Enhanced transit access, bicycle infrastructure, and Transportation Demand Management programs will support this ratio into the future.

Parking Location Map

Figure 1 shows the location of accessory and public parking. Public parking will be concentrated on D1, D2, D6, and D3, while D7, D5, and D4 provide accessory parking only. The public parking can be accessed outside of the heart of the square, on Concord Avenue, Everett Street, Webster Avenue, and Somerville Avenue, a best practice that will intercept traffic before it gets to the square's retail core.

Figure 1 Parking Location Map

Number of Spaces Provided

Applicant proposes to provide parking as outlined in Table 3 below:

Table 3 Parking Provision

Lot	Accessory	Commercial	
D1.1	50		
D1.2		385	
D2.2		290	
D3.1		270	
D3.3		300	
D4.3	25		
D5.1	5		
D5.3	15		
D6.1	55		
D6.2	55		
D7.1	20		
D7.2	30		
Total	255	1,245	1,500
Percentage	17%	83%	100%

Changes in Parking from Existing Condition

The Union Square development will add significant parking on each site with the exception of D7. In total, the project will add just over 1,000 new parking spaces to Union Square, with most spaces concentrated on D1, D2, and D3. These parcels will have commercial parking that is open to all, while other parcels will have accessory parking to serve local uses. Table 4 provides an overview of the changes in parking supply by site.

Table 4: Net Change in Parking Supply by Site

Site	Existing Parking	Proposed Parking	Net Change
D1	87	435	348
D2	17	290	273
D3	46	570	524
D4	0	25	25
D5	11	20	9
D6	48	110	62
D7	110	50	-60
TOTAL	319	1,500	1,181

Appendix D3

Example Shared Parking Model Calculation

CITY OF SOMERVILLE PARKING DEMAND MODEL

Union Square Redevelopment

Parking Demand Calculator

	Office/Lab SF	Hotel Rooms	Residential Units
	↓↓ Replace Numbers Below ↓↓		
Site 1	1,158,000	175	998
Site 2	54,000		
Site 3			
Site 4			
Site 5			
Site 6			
TOTAL	**1,212,000**	**175**	**998**
Space/1000	1212	-	-
ITE Base Rate	2.47/1000	0.6/room	1.1/DU
NN Adjustments	0.68	0.68	0.70
	1.0812672	0.92	0.69
	0.06180928	0.5712	0.70
Adjusted Rate	0.80	0.36	0.37

Off-Street Spaces

Space per Use Category	966	63	371
Total Spaces Allowed (max)	**1400**		

Reserved Off-Street Spaces

% of Total per Use	10%	30%	50%
# of Total per Use	96.61	52.50	185.58
Total Allowed (max)	**335**		

See Zoning

These spaces are provided as off-street commercial parking made available on a monthly, daily, or hourly basis as desired by the operator. Only a certain number may be provided as reserved spaces for a specific user.

Retail Parking Demand Calculator

	Retail SF
	↓↓
Site 1	123,000
Site 2	
Site 3	
Site 4	
Site 5	
Site 6	
TOTAL	**123,000**
Space/1000	123
ITE Base Rate	2.55/1000
NN Adjustments	0.68
	0.92
	2.4276
Adjusted Rate	1.52

On-Street Spaces

Ideal	**187**

Note: An additional 95 parking spaces are provided in the study area for retail parking for a grand total of 1,495 parking spaces.

Appendix D4

Excerpt from the Union Square Neighborhood Plan, Streetscape Planning

Improving the Street Network

Improving flow and reconnecting across former barriers

The core of Union Square's street network is designed as a multi-lane, one-way 'bow tie' where Somerville Avenue, Washington Street, Webster Avenue, and Prospect Street all restrict travel as a one-way couplet. These streets are confusing, switch direction back and forth from one way to the next. To stay on Somerville Avenue heading east you have to turn left. To stay on Washington Street heading west you have to turn right. Traffic in any direction is forced onto the same streets and the resulting congestion frustrates drivers, delays buses, and puts both pedestrians and cyclists at risk.

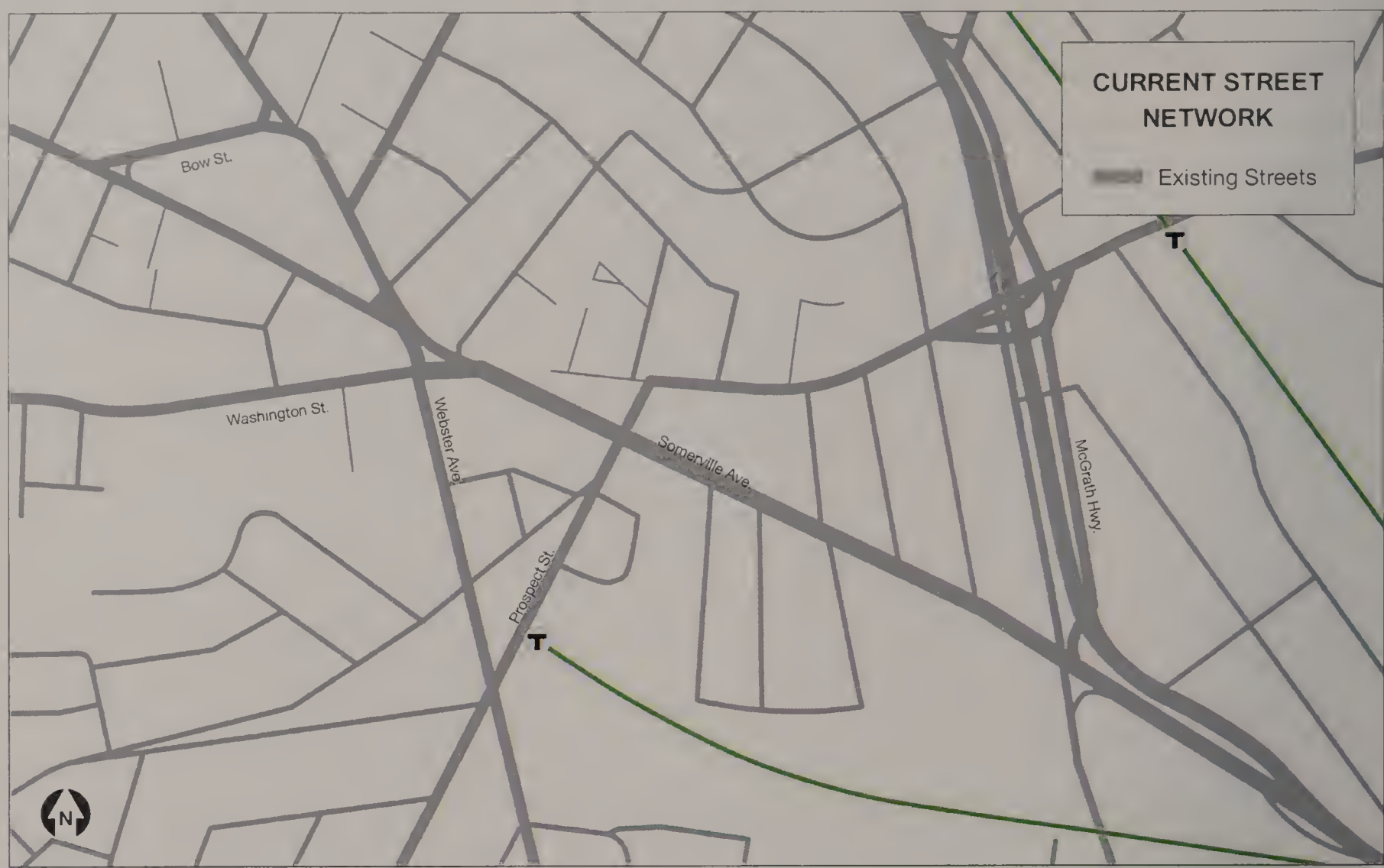
In 2016, the City will return Prospect Street and Webster Street, from Somerville Avenue to their crossing, to two-way traffic for the first time in decades. By re-striping the streets and installing new traffic signals on an interim basis, the City will test the removal of unnecessary traffic movements to inform a more formal and permanent design to alleviate congestion and improve traffic flow in the future.

Along the eastern edge of the Union Square plan area is the infamous Route 28, a six-lane divided highway better known as McGrath Highway. A portion of Route 28, The McCarthy Overpass, is an elevated section, or viaduct, between the Squires Bridge at Medford Street and the bridge over the Fitchburg Commuter Rail Line in Boynton Yards. The primary purpose of this structure is to allow north-south traffic to bypass east-west traffic on Washington Street.

In the past few years, MassDOT has repaired the aging overpass and improvements to the on and off ramps and cycling facilities are near completion. Over the long term, MassDOT will replace the elevated McCarthy Overpass with an at-grade urban boulevard solution from the section of Route 28 between Broadway in Somerville to Third Street in Cambridge.

A CONCEPT FOR THE FUTURE

The following pages include specific strategies for improving walking and cycling in Union Square, along with conceptual designs to further improve the design of our streets. Although well informed, these designs are intended to demonstrate possibility. Each street will need proper surveying and engineering to implement an appropriate design. Chapter 3 establishes many goals for the streets of Union Square, but the primary objectives are to return the main streets of the square to two-way traffic and introduce a street network on the eastern side of the Union Square plan that stitches the neighborhood back together with East Somerville and Brickbottom, a connection that existed prior to Route 28.



ABOVE: Existing street network in Union Square.

BELOW: Proposed street network in Union Square.

Improving Walkability

Making the Cheapest Form of Transit the Most Enjoyable

Somerville is ranked as one of the most walkable municipalities in the Unites States by walkscore.com. This honor reflects our city's historic development pattern of small, close-knit residential blocks and mixed-use neighborhood squares distributed frequently throughout the city. Somerville owes this pattern to a time period when cities were built at the human scale, before the automobile entered the picture. Today only 5% of Somerville's residents live more than a five-minute walk from most of their daily needs.

Somerville's high rate of walkability is also a result of targeted public policy decisions. Over the past 10 years, the City of Somerville has prioritized its pedestrian environment by instituting progressive policies and backing them up with meaningful capital investments. When asked 'what kind of community does Somerville want to be?" Mayor Curtatone spreads a message reflecting our residents desire to make Somerville the most walkable city in the United States.

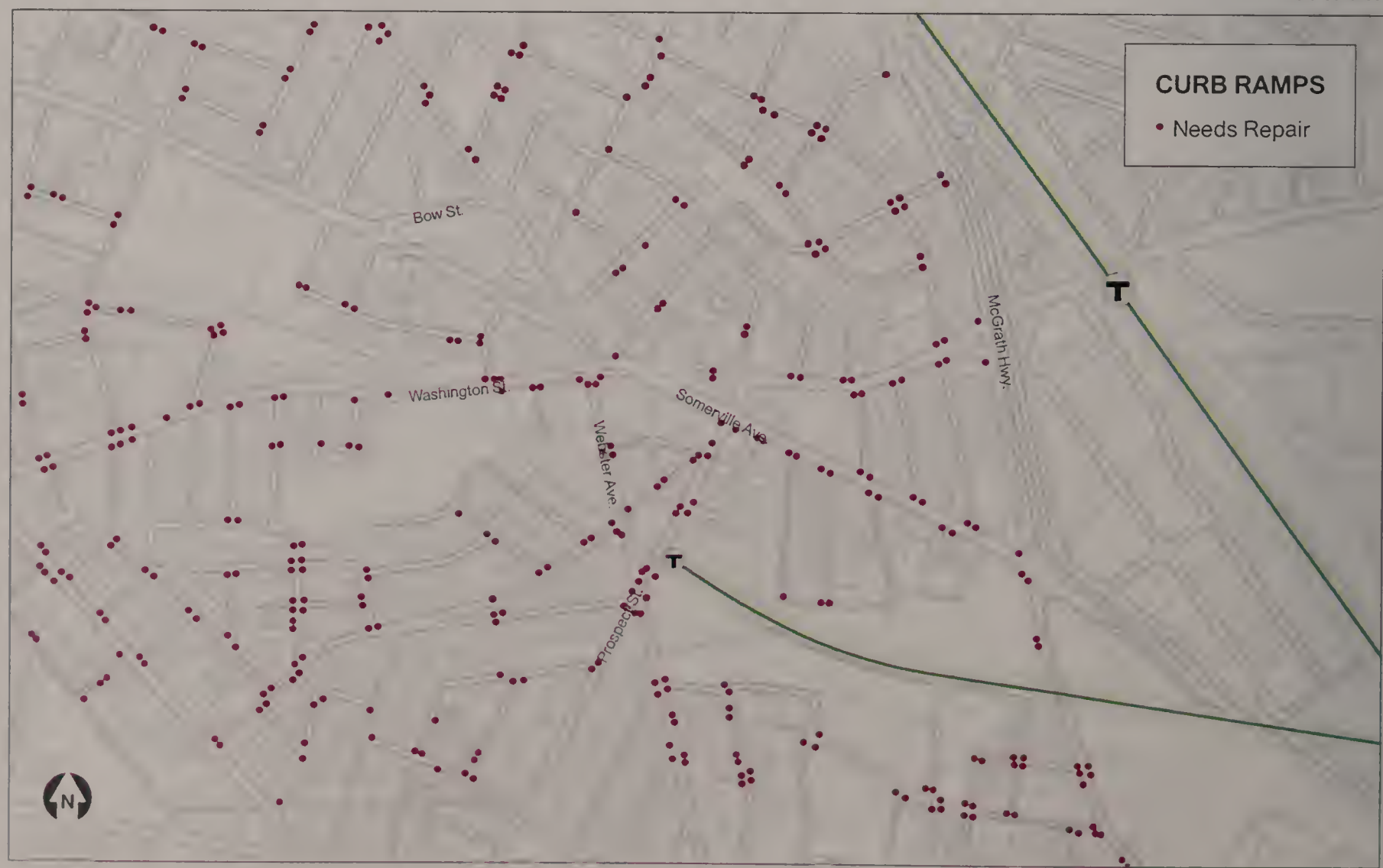
In his book Walkable City, Urban Designer Jeff Speck, a Massachusetts-based national expert on walkability, explains that to build a city that is appealing to pedestrians, our streets must provide a walk that is simultaneously useful, safe, comfortable, and interesting. Furthermore, Speck advocates that walkability is the most important factor in building a city that supports public health, economic competitiveness, and environmental sustainability.

Many of Speck's 10 Steps to a Walkable City are already in place in the Union Square plan area. The urban fabric surrounding the future Union Square station of the Green Line has strong density, short blocks, diverse civic spaces, and daily and weekly needs within a reasonable distance of most homes. The main thing that is lacking is local jobs. Despite the neighborhood's highly walkable characteristics, most people still have leave on a daily basis to go to work.

Redevelopment efforts in the plan area are focused on positioning the area to become a new Urban Employment Center type of station area (see page 44). This employment center will eventually include almost 15,500 new jobs and 2,500 new housing units. These new residents and employees will bring a whole new world of pedestrian activity to Union Square and Boynton Yards rivaling Davis Square's vibrancy. But we don't need to wait for redevelopment to invest in walkability. The City's Neighborhood Street Reconstruction Program is already improving the public realm for existing residents and workers to promote a vibrant public life and deliver on the promise to make Somerville a city that puts pedestrians first.

ABOVE: Using the 2013 Pedestrian Accessibility Study, an input in the Neighborhood Streets Reconstruction Program, surveyed and catalogued existing sidwalk conditions. Sidewalks needing repair were ranked based on their proximity to a train station (existing or proposed) and their proximity to a high pedestrian parcel.

BELOW: Using the 2013 Pedestrian Accessibility Study, an input in the Neighborhood Streets Reconstruction Program, existing sidewalk ramps were surveyed and cataloged. Ramps needing repair to comply with MAAB standards were identified.



Improving Cycling

Embracing Protected Bikeways

It's official. Bicycling is the most efficient way to get from Union Square to Downtown Boston. In 2015, the third annual Rush Hour Race, put travel modes to the test by pitting a Hubway rider, a cyclist on their own bike, a transit rider and a driver against each other on a timed trip from Downtown Boston to Union Square. According to the organizers, the cyclists finished 13 and 11 minutes faster than both the T rider and driver, which finished seconds apart from one another. However, for many people cycling on our city streets can be one of the most harrowing of life's experiences.

FOCUSING ON BICYCLING COMFORT

In 2005, the Transportation Department for the City of Portland, OR was the first to classify the different types of cyclists that exist within a population: the Strong and Fearless (<1%), Enthused and Confident (7%), Interested but Concerned (60%), and No Way, No How (33%). Since then, their research has change the way towns and cities plan for cyclists across the United States.

Strong and Fearless cyclists are the smallest in number but the strongest riders and not deterred by conditions in any way. Enthused and Confident cyclists, a small portion of any population, are comfortable sharing the roadway with automobiles, but they prefer their own facilities. This demographic is the primary reason cycling has grown over the last 10 years. By adding facilities, cities have been able to tap into this group. The Interested but Concerned group is the largest in number and curious about cycling. They are currently mostly riding bicycles for recreational purposes. The last group, No Way, No How, is self-descriptive, but hurdles to cycling are not only based on attitude and ability, but topography and weather can also be a deterrent for many. Although the differences are not hard and fast, these categories have proven to be a fair representation of the spectrum of riders from within any given population.

No matter the category, surveys have found that the number one reason that many people do not consider bicycling as a valid means of transportation is because they are afraid to be on the same roadway as automobiles. Achieving SomerVision's goal for 50% of trips to be via transit, cycling, or walking will require making our streets, wherever we can, as safe and comfortable for the Interested but Concerned group of the population. To tap into this largest group of potential cyclists, Somerville will need to make transformative investments in bicycle infrastructure - and that can begin in step with redevelopment in Union Square.

TYPES OF CYCLISTS

STRONG AND FEARLESS (<1%)

Comfort Level

- Identifies as a 'cyclist' and riding is a strong part of their identity
- Generally undeterred by roadway or weather conditions
- Comfortable without bike lanes
- Commutes by bicycle to work

ENTHUSED AND CONFIDENT (7%)

Comfort Level

- Comfortable sharing the roadway with automobile traffic
- Prefers operating in dedicated bicycle facilities
- Attracted to streets that work well for bicycling
- Appreciates bicycle lanes and bicycle boulevards

INTERESTED BUT CONCERNED (60%)

Comfort Level

- Likes to ride a bicycle, but is afraid to ride among automobiles
- Prefers quiet neighborhood streets, fully protected bikeways, and off-street paths
- Rarely ventures onto arterial streets
- Concerened about potential injury

NO WAY, NO HOW (33%)

Comfort Level

- Currently not interested in bicycling at all
- Uncomfortable on a bicycle

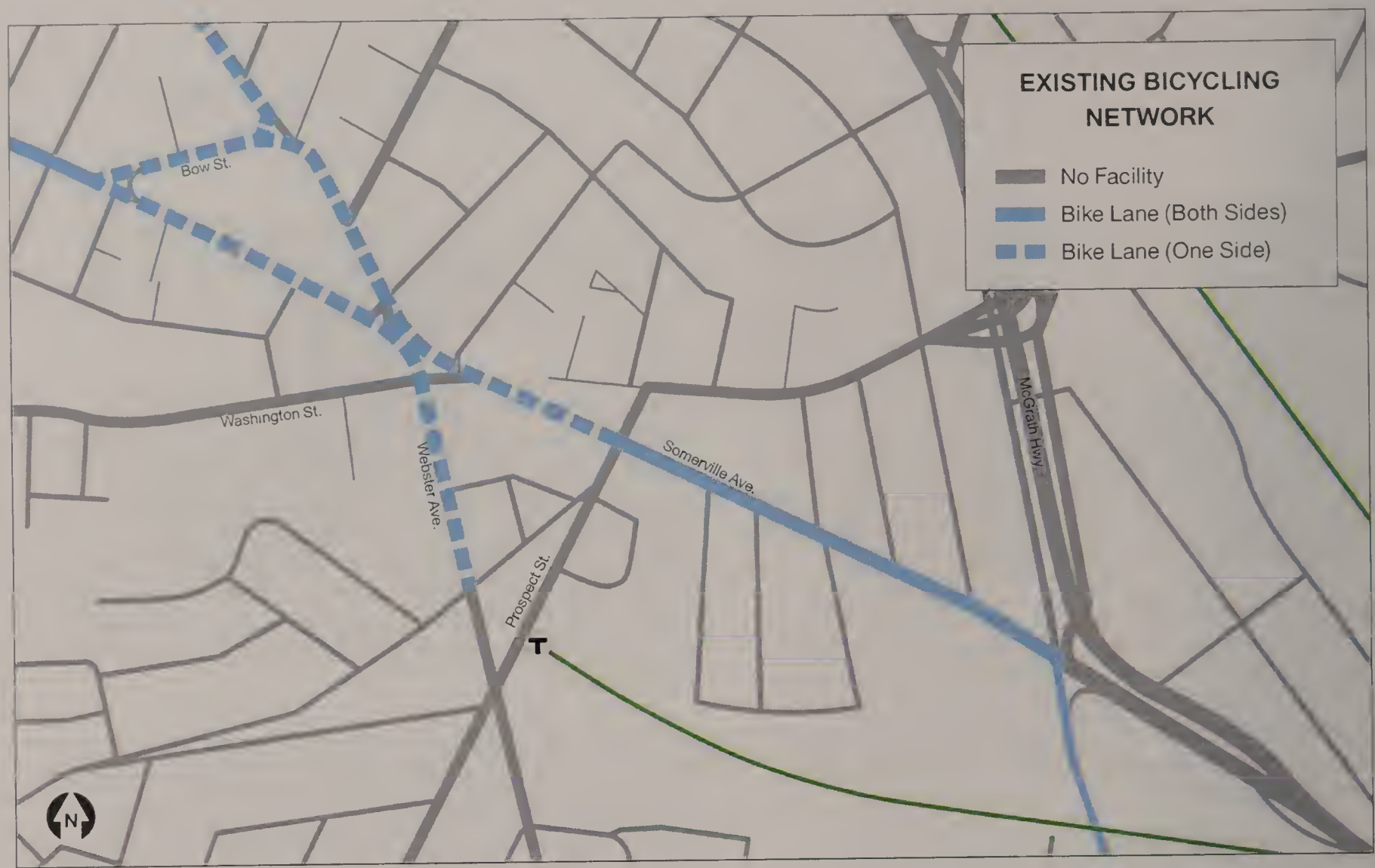
During Toronto's 2014 elections, an activist-led campaign focused many candidates on a meaningful transportation policy to create what international walking and bicycling advocate Gil Penalosa calls a #MinimumGrid. This initiative is focused on making biking a viable transportation option by creating a fully connected grid of protected bikeways on busy streets and bicycle boulevards through quiet neighborhoods. Penolosa encourages cities to move past the 'nice-to-haves' like signage, maps, bike racks, and shelters that make it nicer to cycle for the 1 to 2 percent of people that are already biking. The nice-tohaves won't deliver the broader public benefits that come from making cycling mainstream.

Protected bikeways are a category of bicycle facility that separates bicyclists from motorists. They can be at road or sidewalk level and separation can be created in a variety of ways including parked cars, plastic posts, raised curbs, or even planters. The means of separation can even change along a route depending on the width available and the design of intersections.

In Boston, a cyclist named Jonathan Fertig created a separated bike lane on Massachusetts Avenue using simple potted plants after growing frustrated with motor vehicles entering the standard painted bike lane. More permanent versions of protected bikeways can be found on Western Avenue and Vasser Street in Cambridge, both at sidewalk level. By fall of 2017, the City of Somerville will also have its first protected bikeway on Beacon Street.

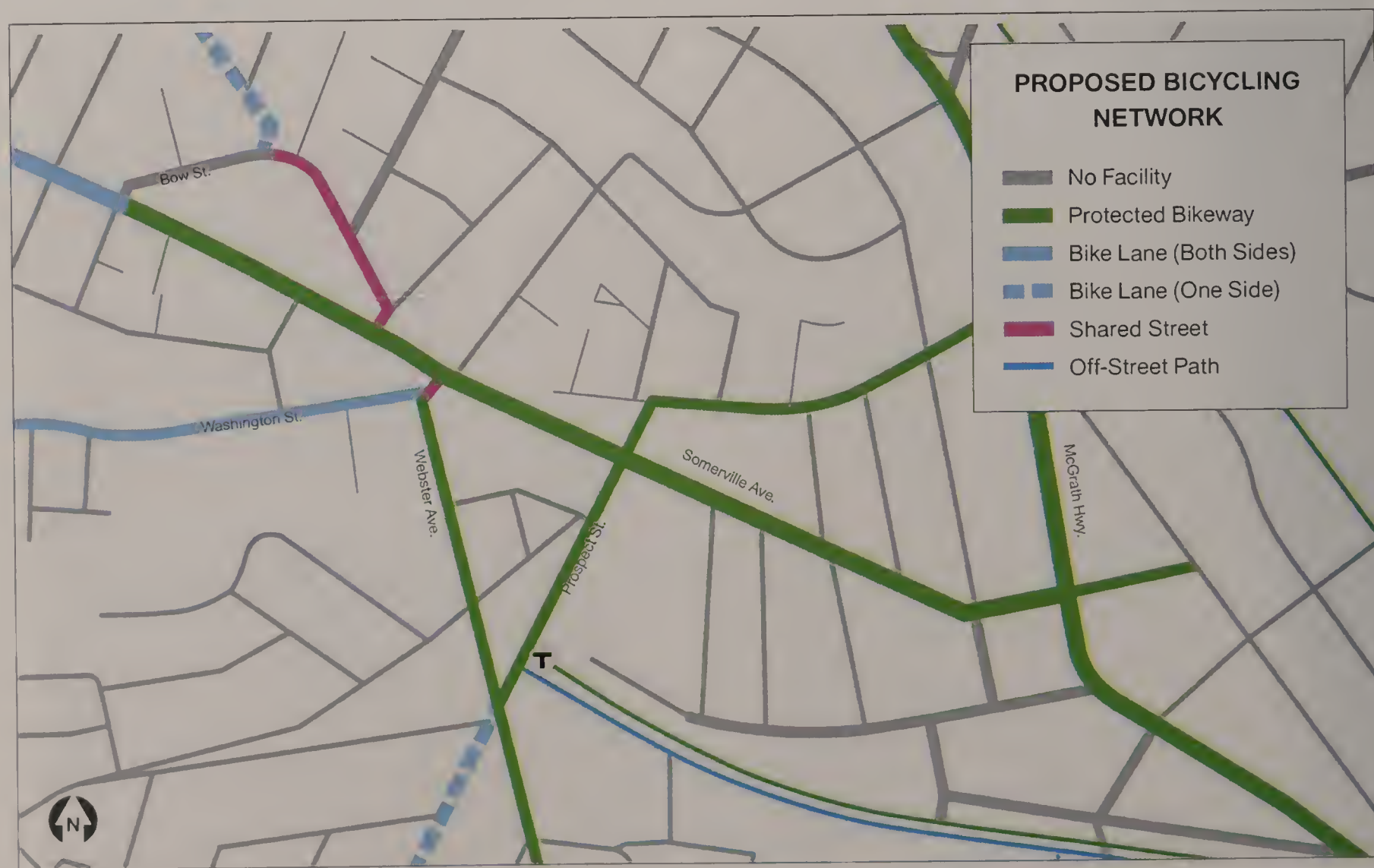
PeopleForBikes, a charitable foundation established by a coalition of bicycling advocates, has helped disseminate information to the public on making bicycling a valid means of transportation that is safe and enjoyable for everyone. Research has found that protected bikeways reduce the risk of injury by up to 90% when compared to standard, unprotected bike lanes. By removing or reducing the sense of fear involved with sharing a travel lane with an automobile, research shows that within the first year after installation, a protected bikeway facility increases bicycle ridership by 75% on average.

Not every street in Somerville is wide enough for a protected bikeway, but sharrows and even bike lanes will not encourage riders afraid of riding along side automobiles to change their travel behavior. The maps to the right identify the existing bicycling network and streets in the Union Square plan area with enough existing right of way width to accommodate a protected bikeway facility of one type or another.



ABOVE: Existing street network in Union Square.

BELOW: Proposed street network in Union Square.



Completing the Main Streets

Balancing the Streets for All Modes of Travel

The Transportation & Infrastructure Division (T&I) of the Mayor's Office of Strategic Planning and Community Development (OSPCD), the Traffic & Parking Department (T&P), and the Engineering Office of the Department of Public Works (DPW) work collaboratively to ensure the City's streets are safe and designed for all users. The Somerville Complete Streets Ordinance, the first of its kind in Massachusetts, states: "Complete Streets are designed and implemented to assure safety and accessibility for all the users of our streets, paths and transit systems, including pedestrians, bicyclists, transit riders, motorists, commercial vehicles, emergency vehicles and for people of all ages and of all abilities." By adopting this ordinance, the City is committed to incorporating Complete Streets planning and design "into public transportation projects in order to provide appropriate accommodation for bicyclists, pedestrians, transit users and persons of all abilities, while promoting safe operation for all users, in comprehensive and connected networks, in a manner consistent with, and supportive of, the surrounding community."

A PEDESTRIAN-FIRST HIERARCHY

To implement this Complete Streets policy, the City is advancing a pedestrian-first modal hierarchy. All transportation projects and programs, from scoping to maintenance, will favor pedestrians first, then transit riders, cyclists, and motor vehicles. This will rebalance Somerville's streets to make them more 'complete,' reversing generations of automobile-focused planning and design at the expense of all other transportation modes. This pedestrian-first modal hierarchy resets the default premise for transportation projects in Somerville by acknowledging that every trip begins and ends as a pedestrian.

IMPLEMENTATION

Adopting a complete streets ordinance is a good start in the effort to make the streets of Somerville a more equitable environment for all users. This type of policy provides guidance to government departments, consultants, developers, and community groups for the planning, design, construction, and operation of our transportation system. An important thing to remember when thinking about the design of our streets is that mobility is a means to an end. Achieving our goals for environmental sustainability, improved public health & safety, social equity, economic activity, and vibrant public life won't happen without actually moving beyond an ordinance and actually building complete streets.

The following pages explore the four major main streets in the Union Square plan area: Somerville Avenue, Washington Street, Webster Avenue, and Prospect Street. Each of these streets plays an important role in the overall street network and even different segments along each of their lengths sometimes serve very different purposes. While surveying and engineering analysis is necessary to design a full street reconstruction project, the street sections and streetscape diagrams that follow provide proof that each of these streets can be improved to meet the needs of all users.

FACING PAGE:
TOP: A graphic from the Boston Complete Streets Guidelines.

LEFT: A family crosses Bow Street in front of Citizens Bank.

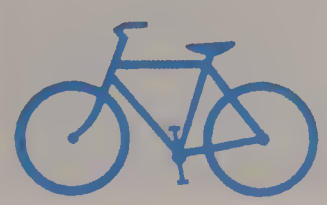
MIDDLE: A cyclist on Somerville Avenue during the morning commute.

BOTTOM: Webster Avenue looking towards the Square

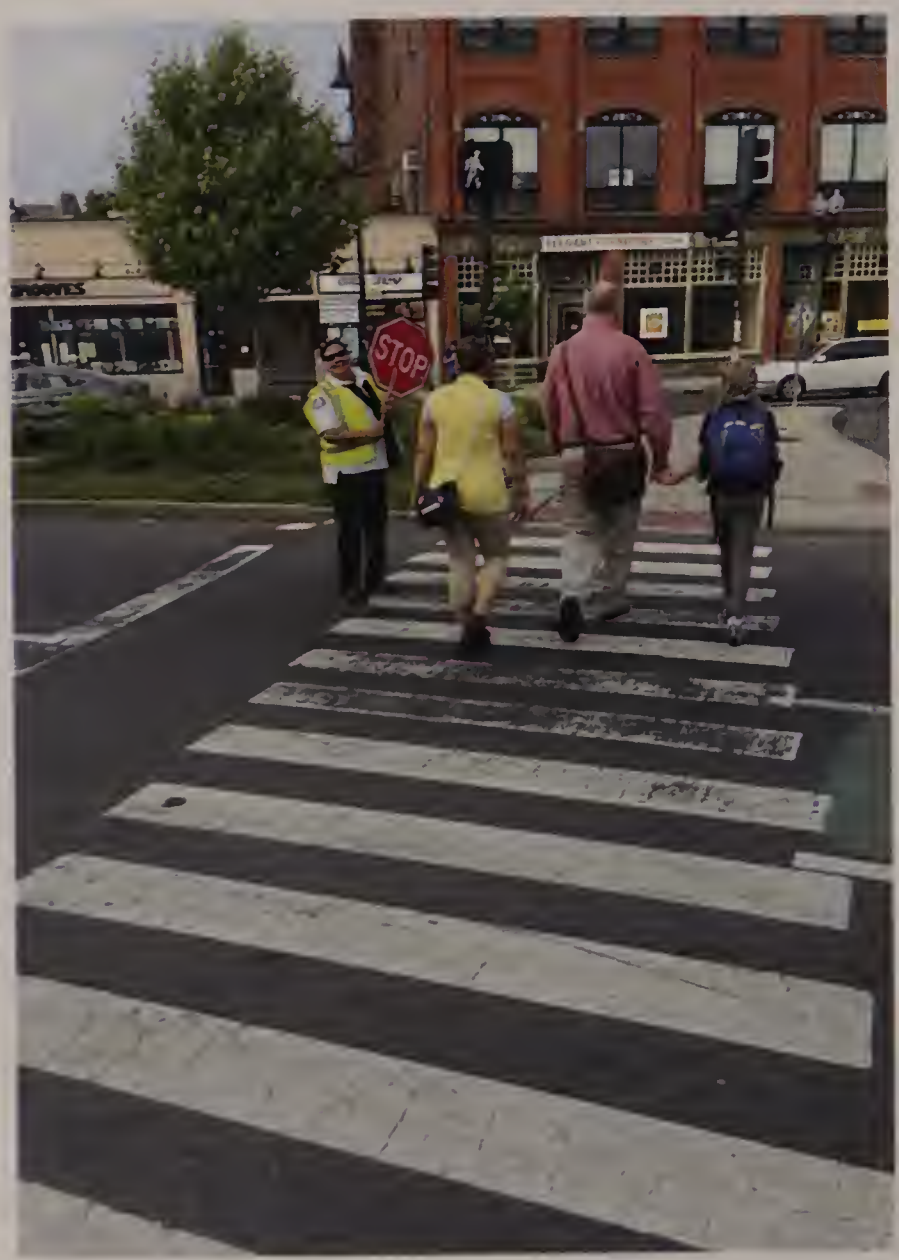
1 Pedestrians

2 Transit

3 Bicycle



4 Motor Vehicle


STOP

SOMERVILLE AVE

Somerville Avenue stretches across Somerville from Porter Square to McGrath Highway. There are three distinct segments in the plan area: Church to Bow Street, the Union Square plaza, and from Union Square to McGrath Highway.

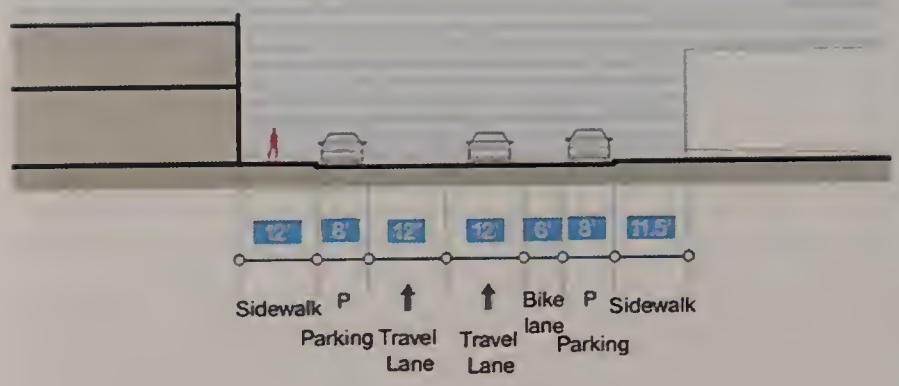
The stretch from Church to Bow Street was created around 1830 after marshlands were filled in. The new street segment was intended to serve as a "straight shot" instead of taking the existing bend in the road, present day Bow Street. This reconfiguration added a new main street to Union Square. Infill buildings followed but not of the same quality of the buildings on Bow Street. Several of these buildings, however, serve as important development markers in the area by reflecting the architecture popular at the time of their construction in the late 19th and early 20th centuries.

The other two segments of Somerville Avenue are two-way but have their own challenges. The stretch of Somerville Avenue fronting the Union Square plaza is plagued by traffic. The southern side is cut off from the bustle of the Square. The right-of-way is wide with no pedestrian connection except at the edges. Past the intersection of Prospect and Washington Streets, retail struggles because the road is too wide.

Independent retail and restaurants thrive when they are located fronting on a slow moving, two-way, customer-friendly street. This is the ultimate priority for the entire length of Somerville Avenue. The one-way section of Somerville Avenue between Church and Bow Streets is an auto-centric design to get automobiles through the square as quickly as possible. Union Square Main Streets emphasized the need for "revitalization...the lack of which already impacts the ability of current businesses on this stretch of Somerville Avenue." Converting this stretch of Somerville Avenue back to two-way, as well as creating/maintaining cycling facilities, increasing sidewalk widths, and improving connectivity will increase the positive experience of users and therefore the chances of success for small businesses.

Studies from Portland, Oregon to Melbourne, Australia show that people walking or biking spend more on average than motorists. In East Village, New York, spending by non-drivers accounted for 95% of all retail spending in the area. In San Francisco, researchers found that non-driving shoppers spent more per month than drivers because they visited the area more often. The changes presented in this plan will create a customer-friendly street and revive struggling sections of Somerville Avenue.

EXISTING CONDITIONS



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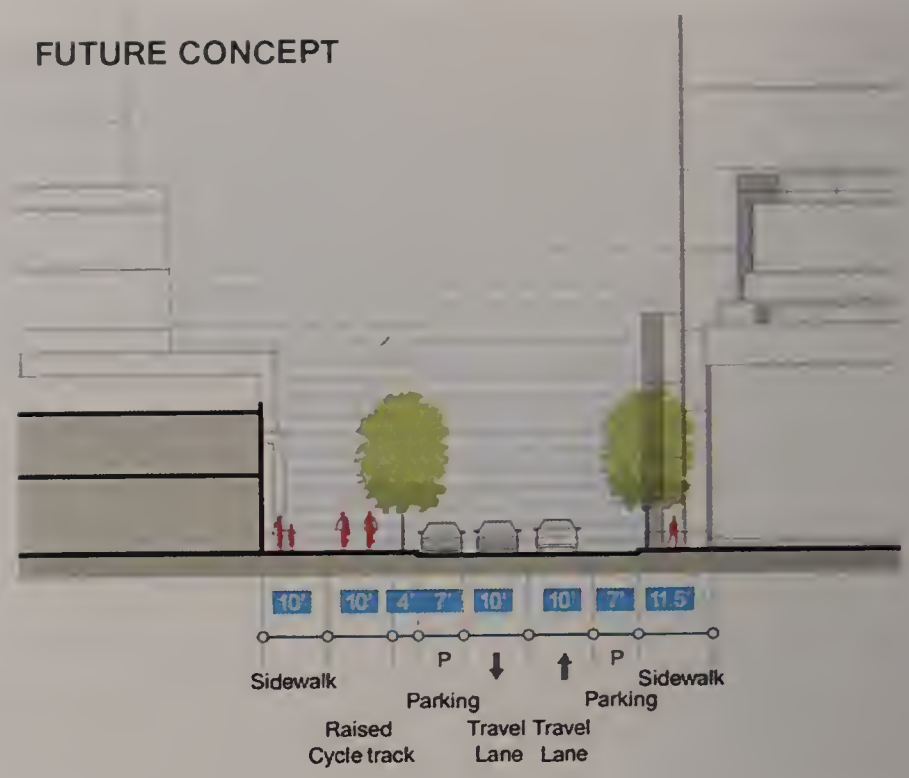

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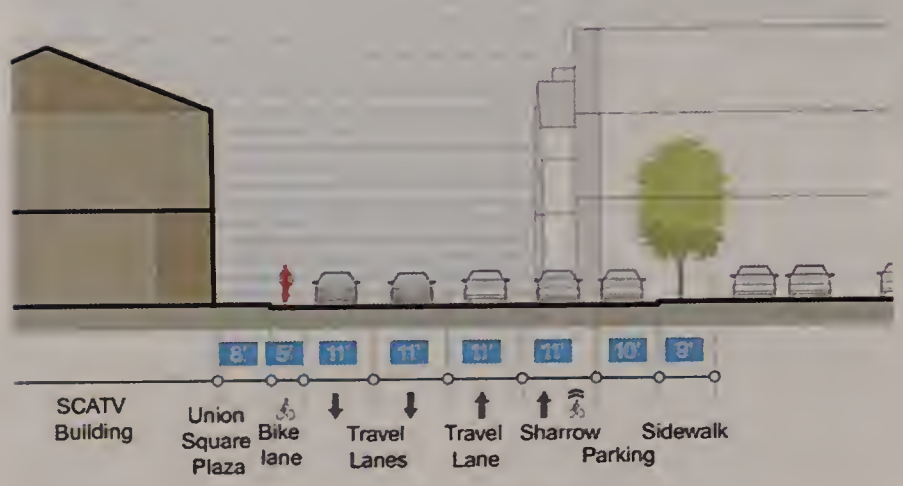

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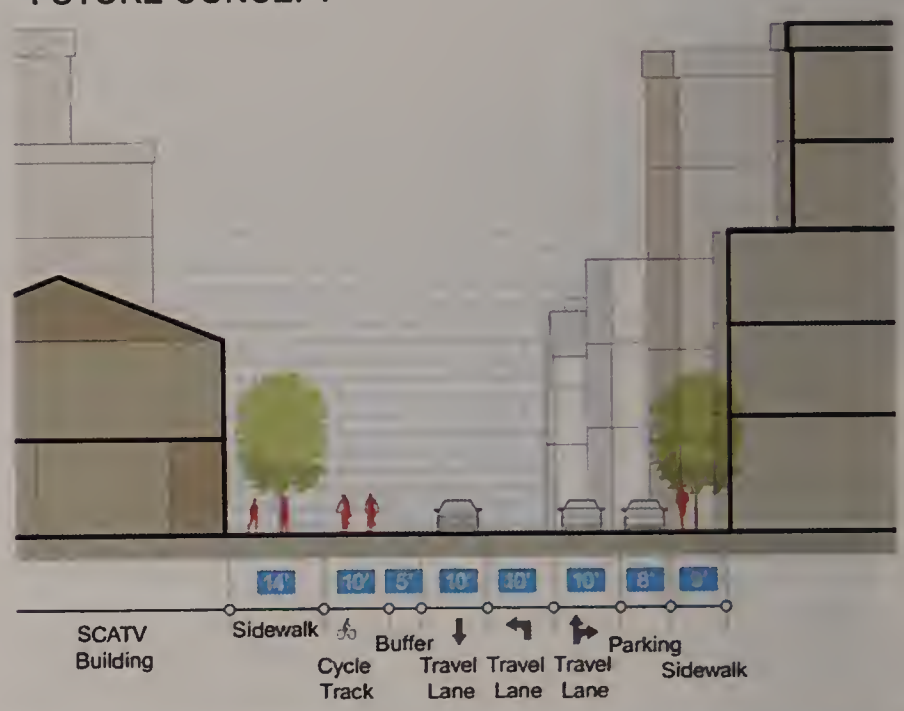
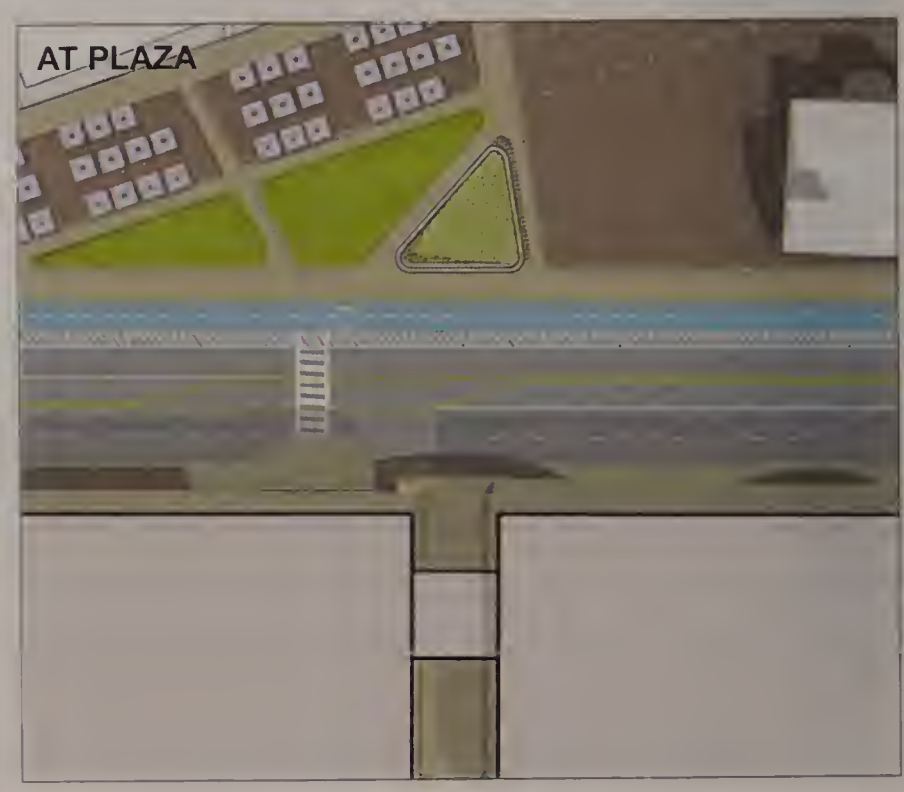




WASHINGTON ST

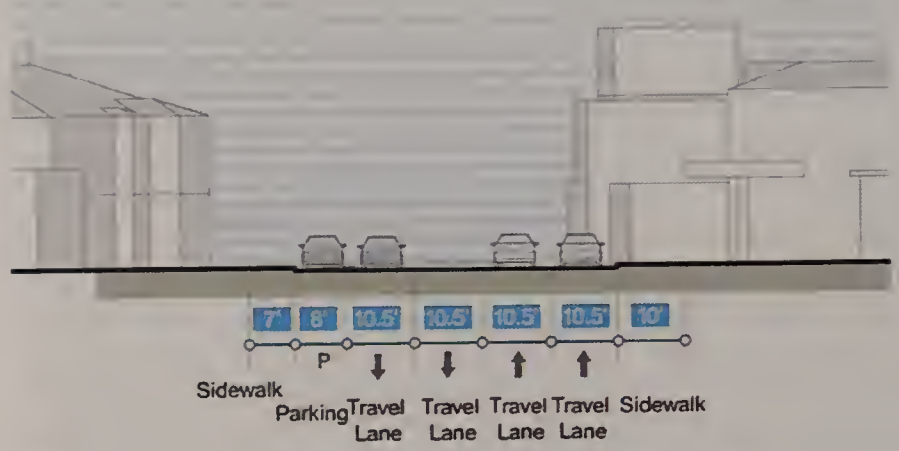
Washington Street connects Harvard to Sullivan Squares and is one of the main streets of Somerville. The street changes context over its extents, from the Cambridge line, to residential in between Beacon Street and Union Square, to a commercial corridor between Union Square and McGrath Highway where the plan area ends.

The west section of Washington Street connects Union Square to Harvard. Argenziano School, a hub for families with K-8 children, and Lincoln Park, the largest city owned park, are also along this stretch of Washington. The street is minimally lined – even the centerline is missing. Cars stack up during peak commute times leading into Union Square, making conditions more precarious for those on foot or bike. Any redesign of the street should encourage users of all ages and abilities to walk or bike. Adequate sidewalk widths and bike facilities are important to prioritize users. They will also buffer existing residents from the street. Street trees will improve the pedestrian experience by providing shade.

The east section of Washington Street connects Union Square to Sullivan Station. The D1 and D5 redevelopment parcels have frontage on Washington Street. Currently the sidewalks are annoyingly narrow and the street is wide. Improving the pedestrian and cyclist experience on this side of the square is essential to correcting the imbalance of space. Increased sidewalk widths will allow for free movement of pedestrians including people with mobility impairments or parents with strollers and space for bus stops. Bicycle facilities will designate space for cyclists in an area that is currently too treacherous for most riders. Lastly, increased sidewalk widths, bike facilities, and parking opportunities are essential to improving the viability of first floor neighborhood serving retail uses.

Improvements on Washington will be part of a larger network of complete streets in Union Square.

EXISTING CONDITIONS



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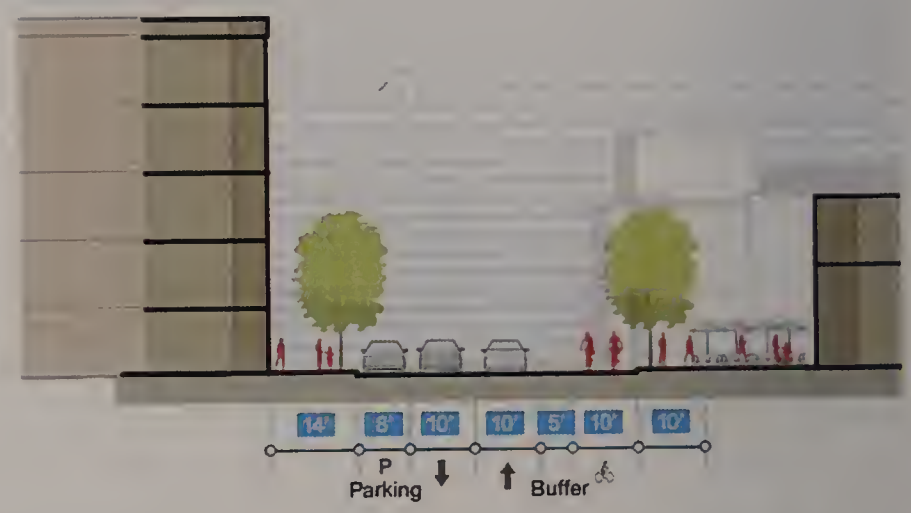
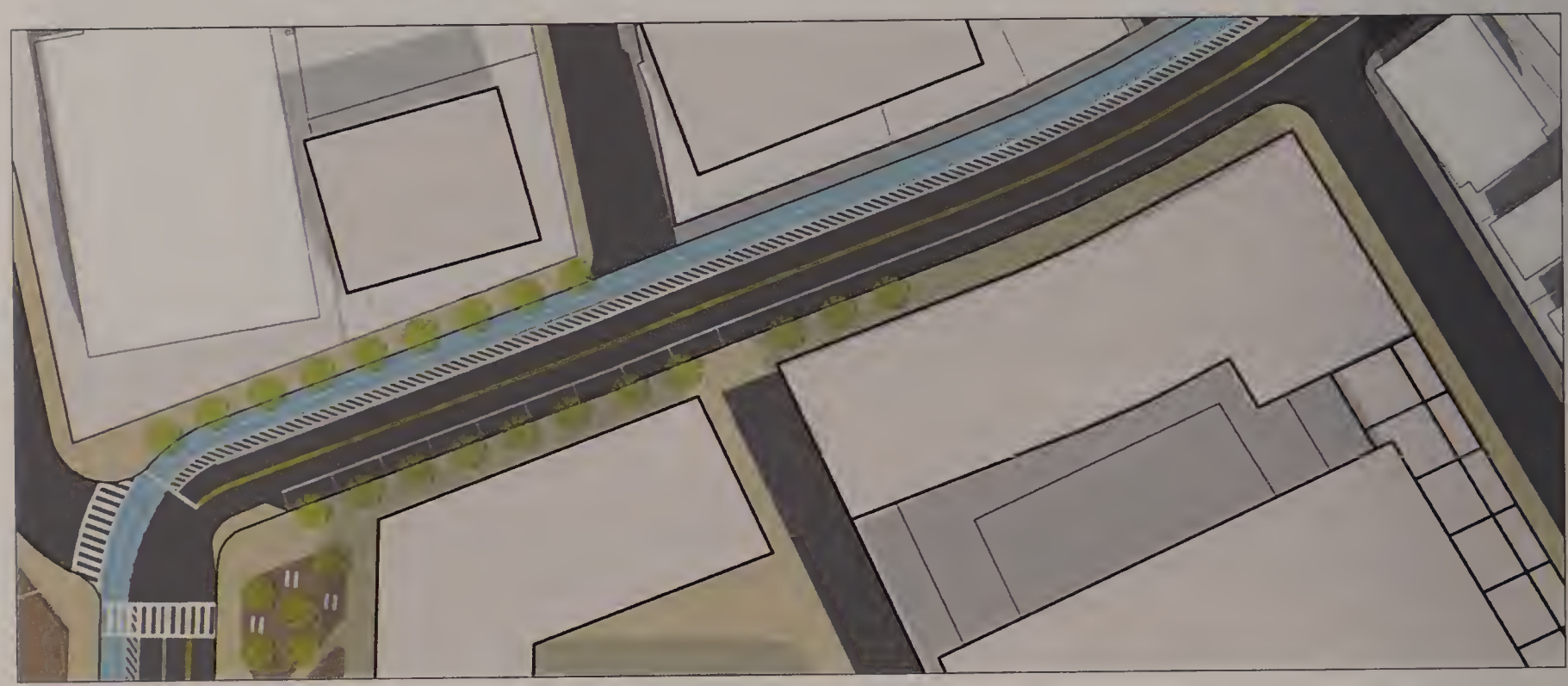
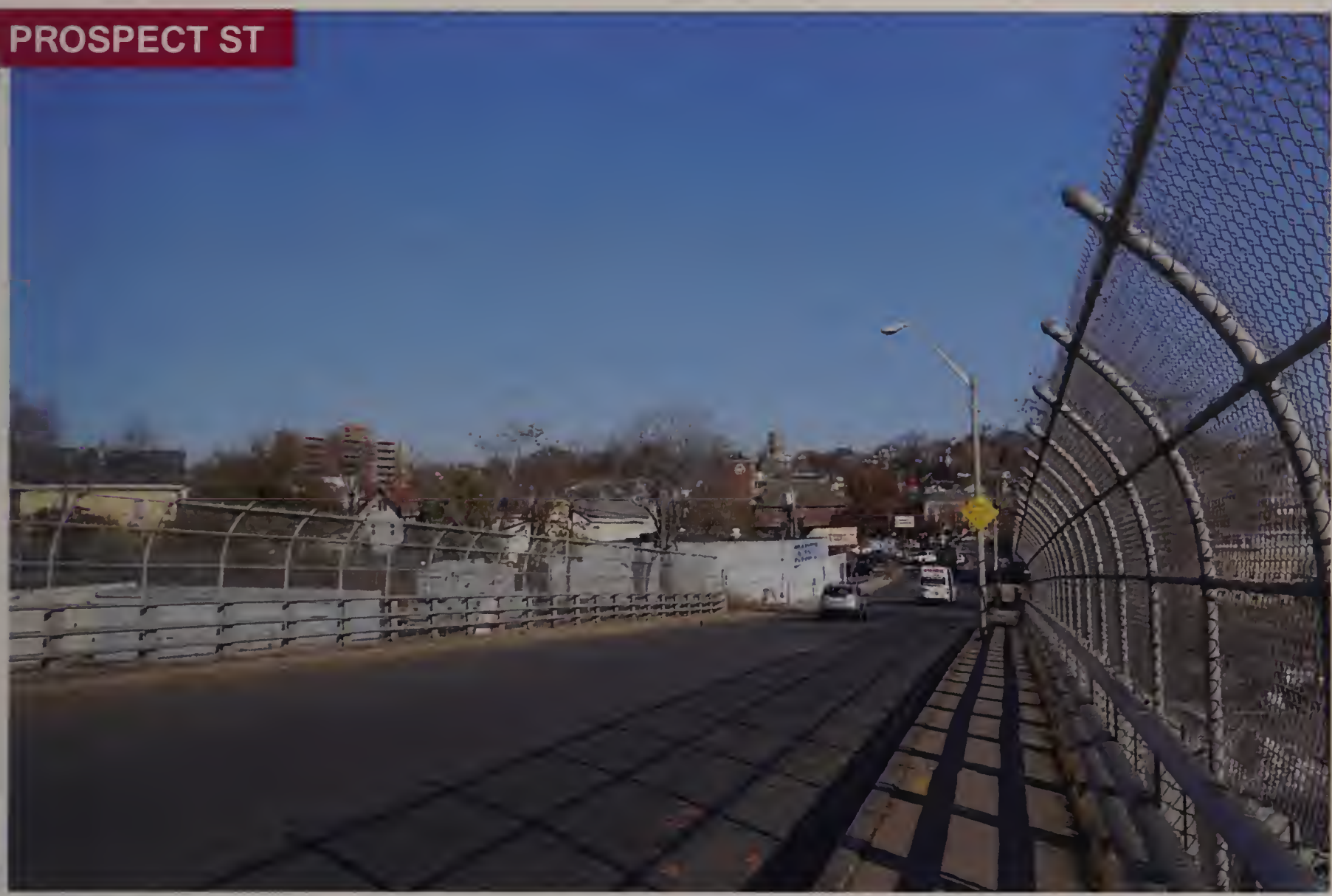




PROSPECT ST



Prospect Street connects Union Square to Central Square in Cambridge. Prospect Street will be changed to two-way and re-striped to include bike lanes in the summer of 2016. However, the condition and width of existing sidewalks is poor. The electrical distribution facility on the west side of the street will stay. The D2, D6, and portions of the D4 redevelopment parcels all have frontage of Prospect Street.

Any improvements will build on the interim work of 2016. The redesign of the Union Square T station entrance will affect the implementation of the priorities for Prospect Street and may require further changes. As of right now, redesigns for the station do not include a headhouse at street level. This means that everyone arriving at the station will enter through the plaza envisioned in front of D2 (see page 182).

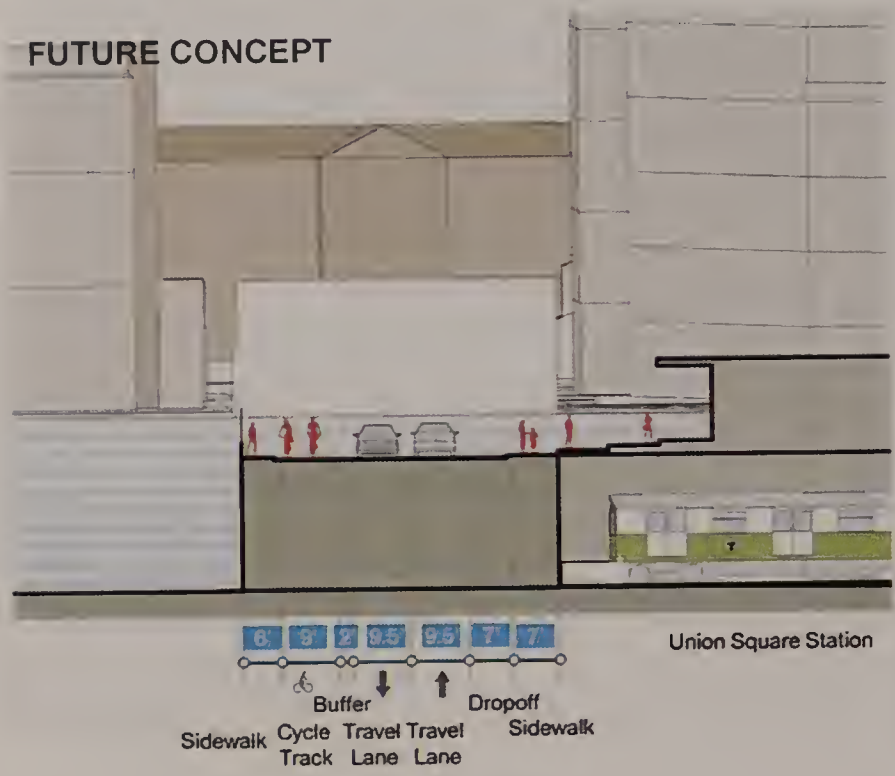
The sidewalks must be widened to accommodate the increase in pedestrian activity on Prospect Street expected from the train station and new development. Connectivity to the T station from the areas west of Prospect, like the pocket neighborhood of Everett, Newton, and Emerson Streets, without having to walk up to Somerville Avenue is important. The crosswalk will also lead people to better pedestrian amenities on the other side of the street.

There are two challenges on Prospect Street. The bridge, owned by MassDOT, will not be rebuilt soon but serves as the westerly connection between Union Square and Boynton Yards. The sidewalks on the east side of the bridge should be widened to connect the community to the jobs center in Boynton Yards. The current fence needs to be removed, pedestrians don't need to be caged in. As Union Square and Boynton Yards develop, the bridge will be one of the only places to view both neighborhoods. In addition, this sidewalk is also a place to look up and view the Prospect Hill Tower.

The other challenge is the transformer site owned by Eversource. It should be screened. The screening material (or screening itself) provides a huge opportunity for new public art in Union Square.

EXISTING CONDITIONS

FUTURE CONCEPT



WEBSTER AVE

Webster Avenue connects Union Square to Kendall Square and MIT. This is especially true for cyclists. In the last three city bicycle and pedestrian counts, an average of 196 cyclists were counted in one hour during the morning commute. The first segment of Webster Avenue, from Somerville Avenue to Prospect Street will be changed to two-way and re-striped to include bike lanes in the summer of 2016. The other segment of Webster Avenue runs from Prospect Street to the Cambridge city line. The crossing of Prospect Street and Webster Avenue is challenging for pedestrians. A portion of the D4 redevelopment parcels front Webster Street. The area between Newton Street and Concord Avenue has the most challenging sidewalk condition.

Currently, parking on Webster Street from Prospect Street to the Cambridge city line is two hour parking. In a meeting with property owners at 429 Norfolk Street, they mentioned that these spaces were generally empty except from Thursday through Sunday when valet services from Inman Square used the spots!

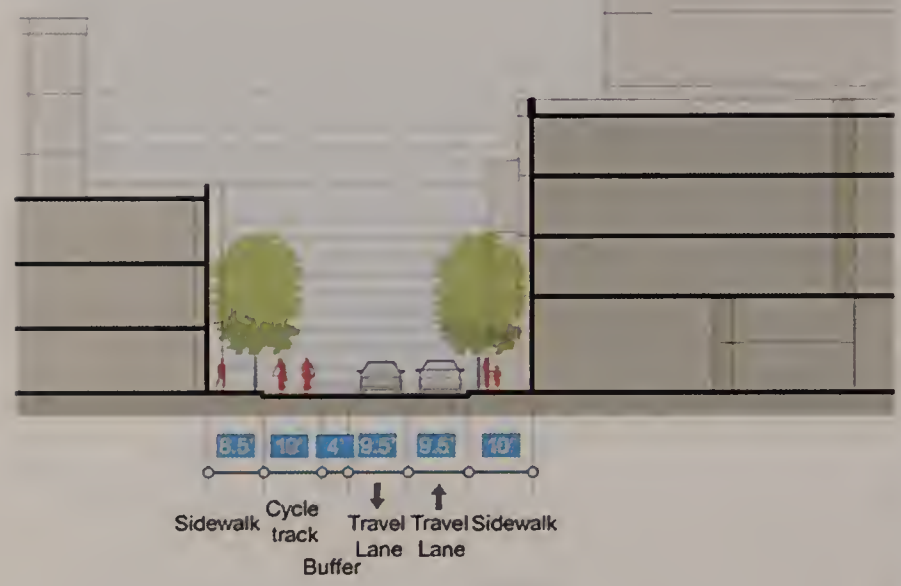
Any improvements made to Webster Avenue will build on the interim improvements of 2016. A bike facility is necessary on the entire length of Webster Avenue because of the frequency of bike travel, especially in the southbound direction. The cycling route should also provide safe left turn access for cyclists into Boynton Yards.

The crossing of Prospect Avenue and Webster Avenue needs improvement. The existing slip lane, the sepArated turn lane from Webster Avenue to Prospect Street isn't necessary after the two-way improvements. Closing the lane makes the intersection smaller. New crosswalks are more square with the intersection which makes pedestrians more visible.

Where narrow, sidewalks need to be widened due to an anticipated increase in pedestrian traffic. In particular, the sidewalks in front of D4 need to be completely rebuilt without highway details like the existing guardrail. Sidewalks, south of Prospect, need to be widened including crossings to provide access into Boynton Yards.

EXISTING CONDITIONS

FUTURE CONCEPT



Calming the Neighborhood Streets

Twenty is Plenty

Everyone with a motor vehicle has their tricks. If they didn't have their tricks the Waze app (the largest community based traffic and navigation app) might have taught them a thing or two by now. In a 2014 NBC Today Show news segment focusing on Waze, residents that were interviewed complained about new traffic on their street but a few also admitted to using the app. Generally speaking, people get frustrated sitting in traffic and look for a way out. They take their frustration out on the residential streets that take them past the snarled intersection. It wasn't the Waze app that started this phenomena. Signs like 'drive like your kids live here' have been around much longer.

High traffic volume through residential streets is usually related to a poorly planned street network. High speed is generally related to poorly street design. Both of these topics were mentioned by members of the community during the Union Square neighborhood planning process.

Local residential streets are central to the feeling of community, so it is no wonder that residents all recognized the absolute necessity for safe neighborhood streets. Many highlighted existing safety concerns due to current and proposed roadwork as well as increased pedestrian activity when the train station opens. Participants acknowledged the need for street designs that would force cars to slow down to increase pedestrian safety and quality of life for residents and visitors alike.

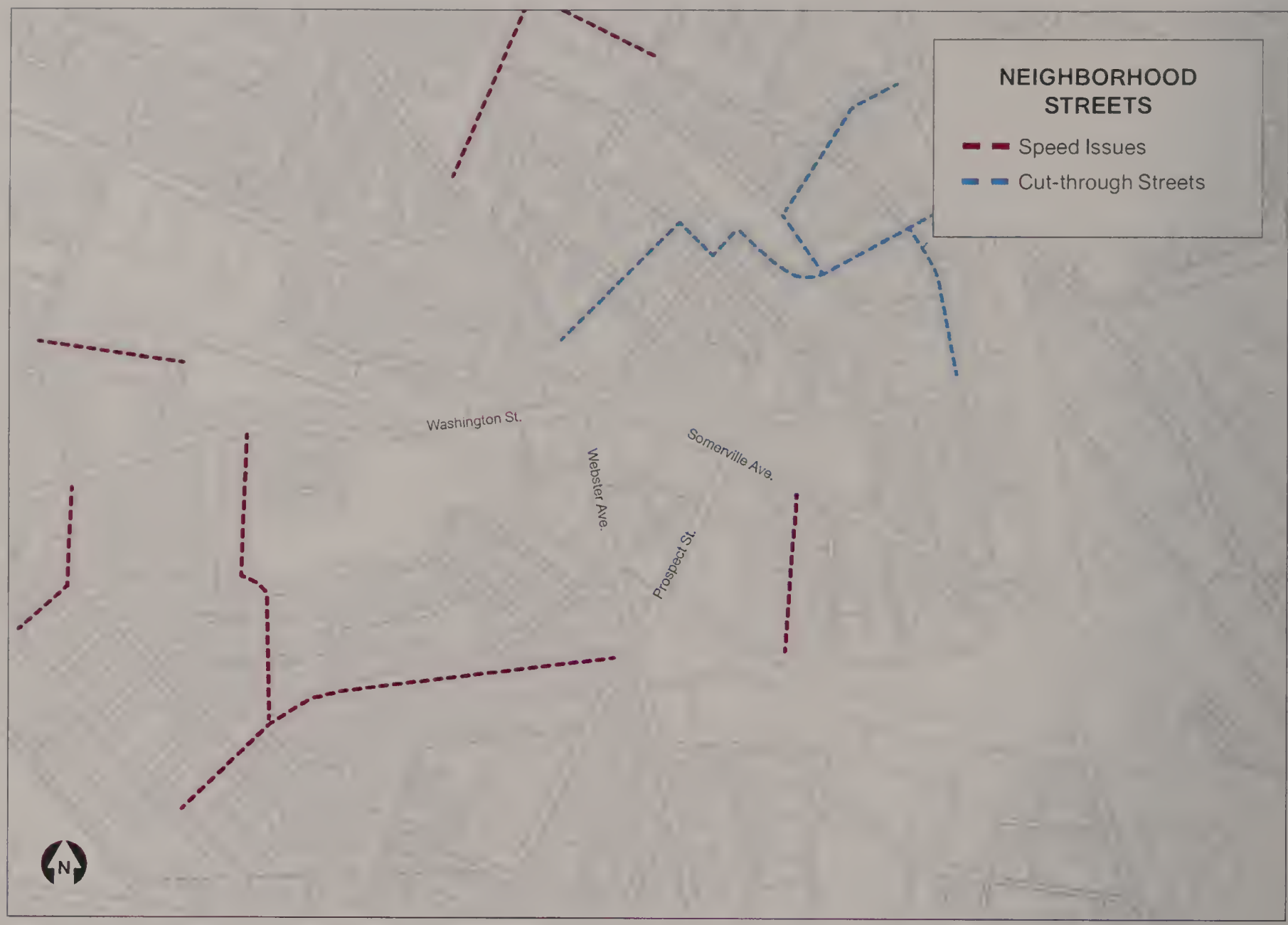
VEHICULAR SPEEDS

In Massachusetts, speed limits on unposted streets are set at 30 mph by state law. To decrease the speed limit, municipalities are required to get approval from MassHighway and the Registry of Motor Vehicles (RMV). Before establishing a new speed limit, an engineering study is required to monitor the prevailing speed of motorists so that a speed limit that is 'safe, reasonable, and self-enforcing' can be established. Traffic engineers use the actual speed that 85 percent of drivers travel at or below to set the appropriate speed limit for a particular street. This '85th percentile' metric is used as a starting point for setting rational speed limits because the actual physical design of a street and a driver's perception of safety greatly impacts the actual speed we feel comfortable driving and is considered to be the maximum safe operating speed for that location.

The most effective way to slow vehicular traffic on urban streets is to create 'visual friction' that impacts a driver's perception of safety. When travel lanes have appropriate widths, streets with two-way traffic flows are generally observed to have slower speeds than one-way streets because drivers are careful not to sideswipe each other. Vehicular speed decreases even further when features like on-street parking and street trees are provided on both sides of the street (causing more 'visual friction'). This happens because objects seen out of our peripheral vision make drivers feel like they are moving faster than they really are, due to the way our eyes see and interpret our surroundings.

The safest type of neighborhood street for pedestrians is one featuring a shared travel lane 14-16 feet wide with no center stripe and parking lanes on both sides. This type of street is called a "yield street" because cars passing each other are forced to slow down and in many cases one car is even required to pull over slightly to make enough room for the other to pass. Yield streets significantly reduce travel speeds and promote safety for all modes because of the 'visual friction' they provide.

TRAFFIC VOLUMES



ABOVE: Streets mentioned during the community process as being problems for residents. Issues include speed and volume of traffic.

Volume on a residential street is usually related to the street network. Simply put, a street network determines where you can and cannot go. There's a classification of streets: arterials (McGrath Highway), local collectors (Somerville Avenue), and local streets. As traffic volumes increased in Somerville and people started to act erratically to avoid traffic, band-aid approaches were applied on local streets. Often times they benefit immediately adjacent residents but have negative impacts on nearby streets or on the network. An example of a large intervention is the switching of two-way streets to one-way while a more minor intervention is a posted sign restricting access during rush hours. Whatever the approach, these changes shift traffic distribution patterns on local streets.

PROSPECT HILL

During the planning process, residents of Prospect Hill spoke loud and clear about the need for traffic calming throughout their neighborhood. People use Prospect Hill as a cut through from McGrath Highway to Somerville Avenue and points beyond. In particular, Greenville Street, Prospect Hill Avenue and Parkway, Boston Street, and Warren Avenue connect McGrath Highway to Somerville Avenue. In the 1990's 'do not enter' signs during posted hours were introduced on Greenville Street and Prospect Hill Avenue and one-ways were introduced on a segment of Boston Street and Stone and Columbus Avenues. Neighbors admit these restrictions are an inconvenience but say this helped reduce some traffic. However, it did not reduce speeds. Residents of Prospect Hill would like to see three things: reduced motor vehicle speeds, full stops by motor vehicles, and a reduction in the amount of non-local traffic.

OTHER OPPORTUNITIES

The experience of Prospect Hill residents is not unique. The speed on Allen Street, Vinal Avenue, Perry Street, Concord Avenue, Dane Avenue, Properzi Way, and Calvin Street were all mentioned. Other residents noted the importance of making the original street network of Somerville, the rangeways that connect Somerville Avenue to Broadway, fully functioning again. Rangeways originally divided the agricultural land of Somerville but today serve as our primary north-south street connections. Walnut and School Streets,

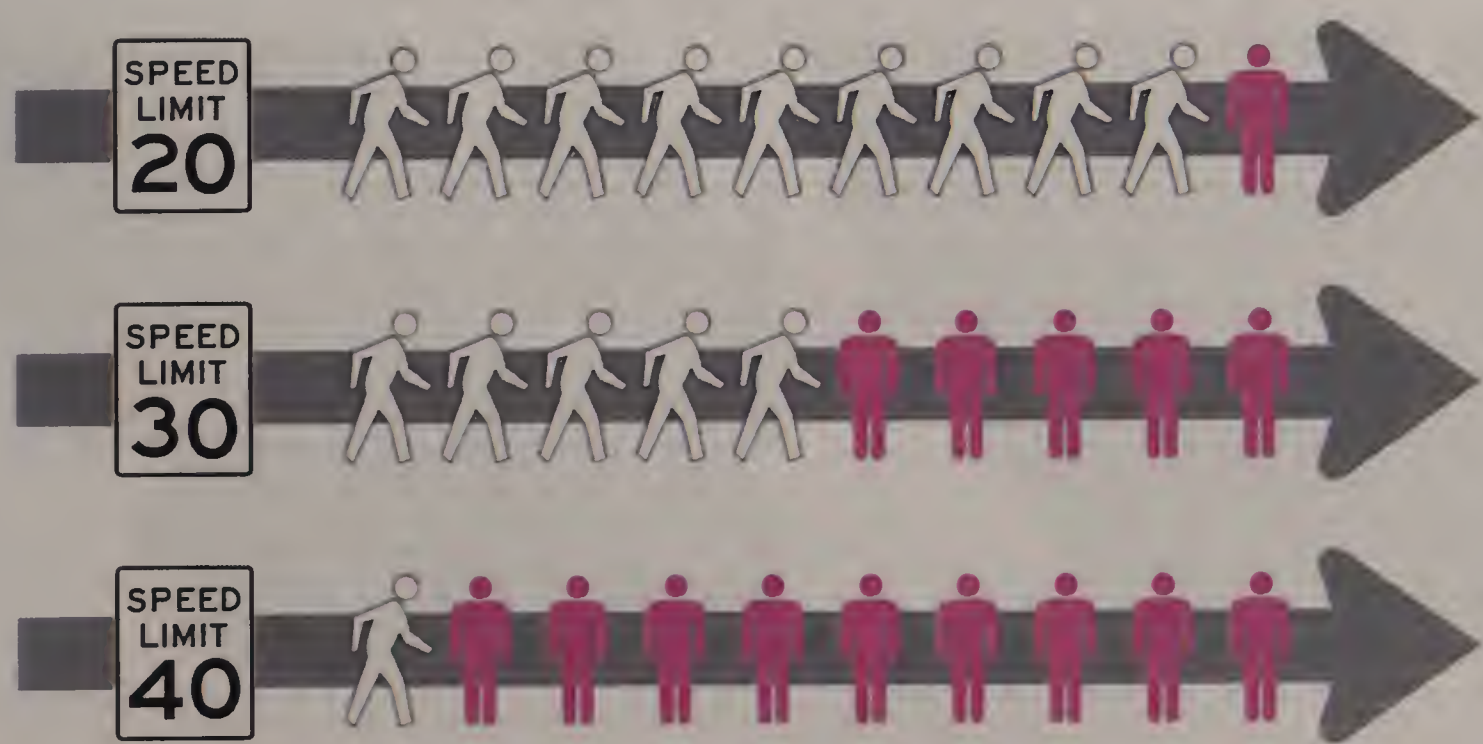
the two rangeways in the plan area, were originally designed as two-way streets. However, Walnut Street is entirely one-way in the northbound direction and portions of School Street have been converted to one-way.

NEXT STEPS FOR CALMER STREETS

While this neighborhood plan has identified the need for a strategy to slow speed and reduce cut-through traffic, it could not evaluate the best options for each street. The Mayor's Office of Strategic Planning and Community Development is pursuing a citywide mobility plan that can provide a more comprehensive strategy for calming neighborhood streets. In the short term, the problematic streets identified by residents during the Union Square neighborhood planning process can be triaged using a suite of traffic calming measures. A Vision for Mobility in Chapter 3 of this plan provides policy guidance related to calming the neighborhood streets of Union Square.

Pedestrian Survival Probability

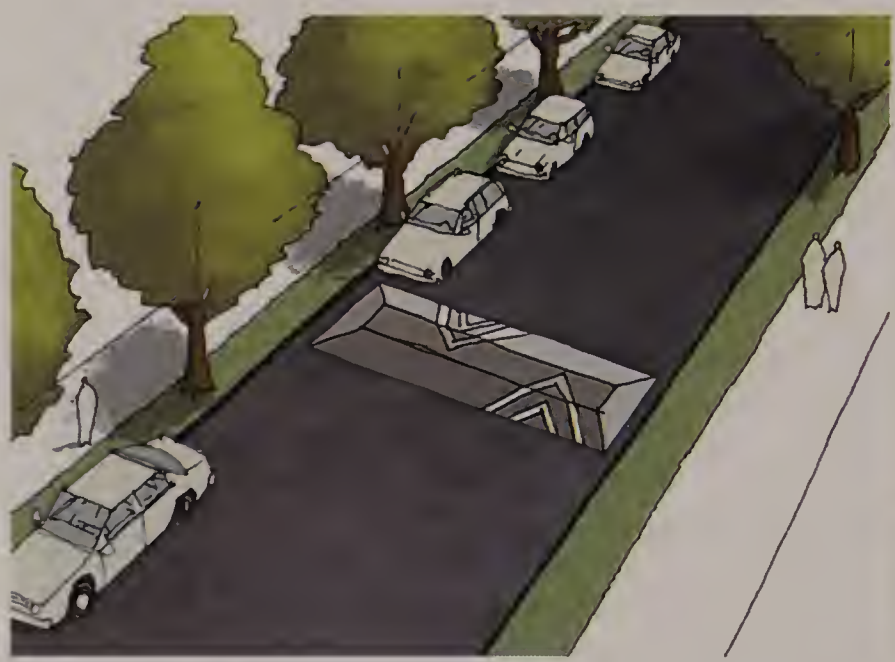
Vehicle speed affects both stopping distances and the severity of crashes. The laws of physics determine that a doubling in vehicle speed results in a stopping distance four times as long. Therefore, a small increase in roadway speeds results in a disproportionately large increase in pedestrian fatalities. Scientific research shows that when vehicles are moving at 25 miles per hour or faster, nearly all crashes result in severe bodily injury and roughly 50% are fatal for pedestrians. When vehicular speed drops to less than 20 miles per hour, injuries for all roadway users, including motorist, bicyclists, and pedestrians significantly decrease.



TRAFFIC CALMING

ABOVE: On-street parking physical narrows the roadway and reduces traffic speed by creating "visual friction" for drivers on one or both sides of the roadway.

ABOVE: Speed humps are rounded, raised portions of the roadway 10-14' long and 3-4" high. They are distinct from the other "speed bumps" found in many parking lots, and often tapered at the curb to allow for unimpeded drainage.



ABOVE: Speed tables are flat topped, raised section of the roadway that are typically 10-14 feet long and 3-4 inches high. They are effective at reducing speeds and are smoother on larger vehicles than speed humps.

ABOVE: Parking lane planters decrease traffic speed in two ways by physicall narrowing the roadway similar to on-street parking and creating "visual friction" in the peripheral vision of drivers.

ABOVE: Chicanes are staggered curb extensions installed on alternating sides of the street that reduce vehicular speed by requiring drivers to manouver through the extensions. Tho calming effect depends on how far the chicane extends into the roadway and can be replicated by alternating on-street parking on one side of the street and the other

ABOVE: Pinch points are curb extensions aligned at mid block locations to narrow a street down to one travel lane. Pinch points may include a crosswalk and/or landscaping in a curb extension.

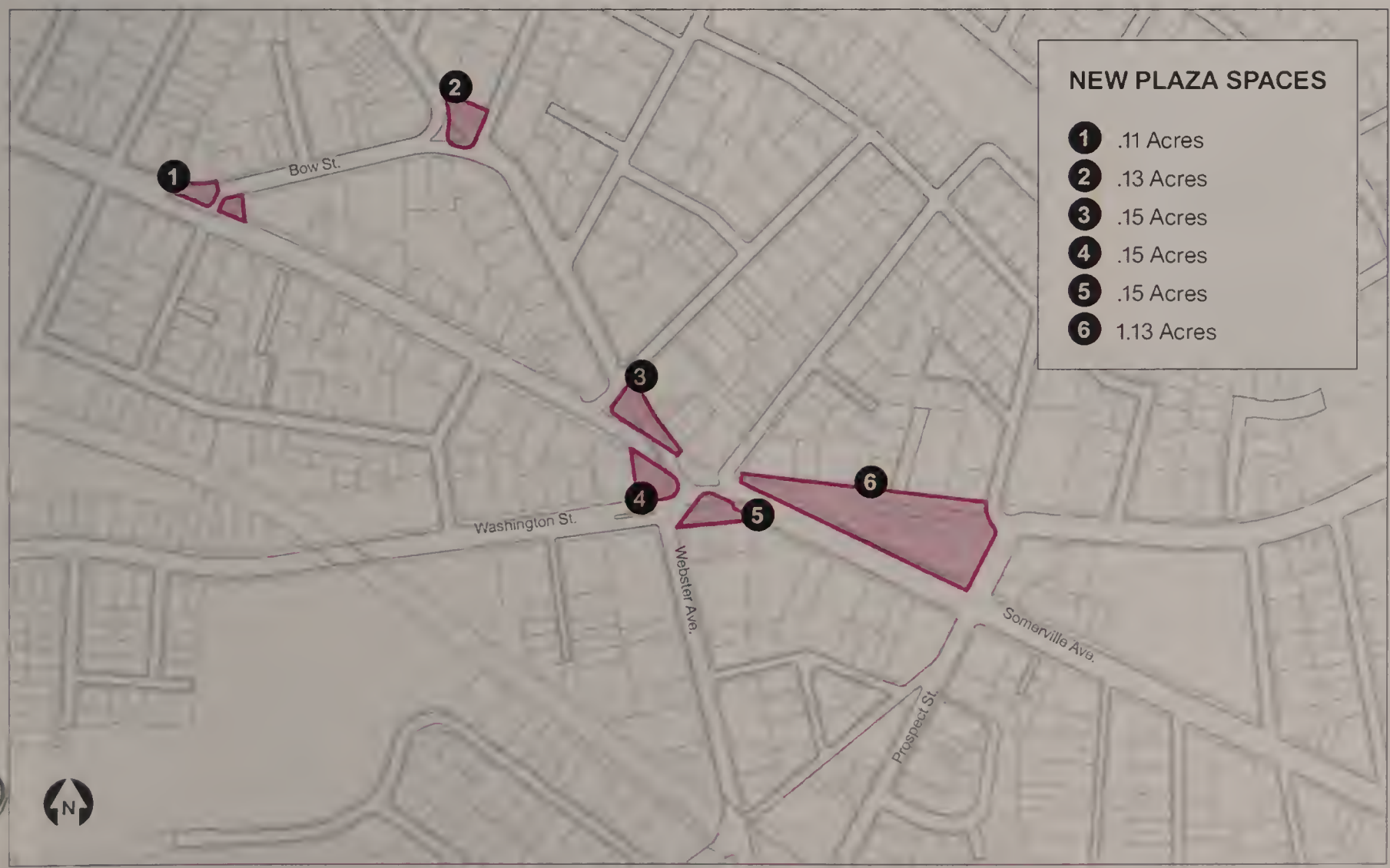
Waste Not, Want Not

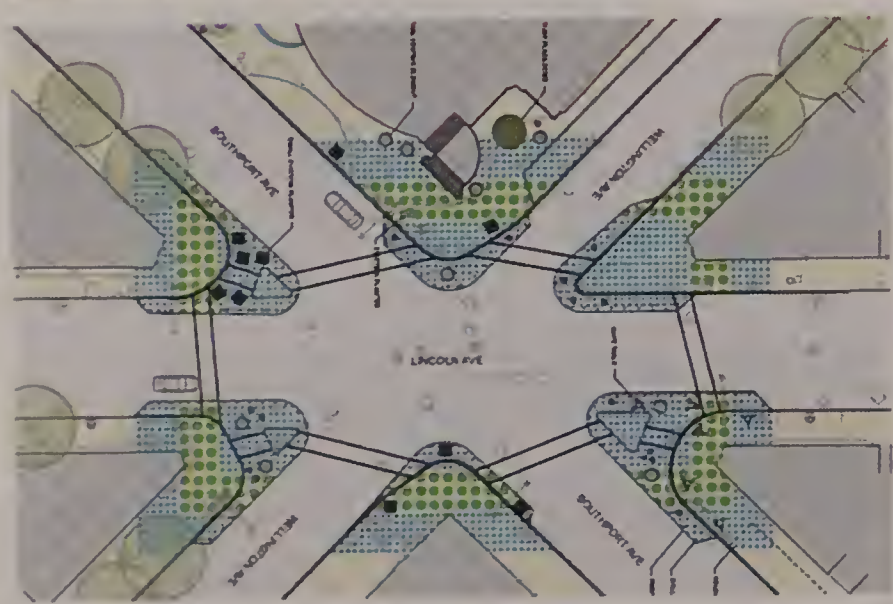
Converting Excess Pavement into Plazas

Public spaces provide areas for active and passive recreation, play host to community and civic gatherings, foster social interactions, and even help us unwind from modern urban life. With only about 4 square miles of land area to deal with, achieving SomerVision's goal for 125 acres of new public space is challenging than for development targets that can go vertical (jobs and housing). With Somerville's densely woven urban fabric providing limited opportunities and relatively little land area available to build new public spaces, achieving this open space goal will require an innovative approach to meet expectations. This begins with looking at our existing assets with new eyes.

The single largest land area available to create new public space is our streets. An important step in implementing the City's Complete Streets Policy (see page 138) is advancing a pedestrian-first hierarchy for all transportation projects that puts pedestrians first, then transit riders, cyclists, and motor vehicles. Pages 138 through 147 investigate new design concepts for Union Square's primary streets. Possibilities for completing these streets are demonstrated for each, but part of rebalancing our streets to make them more 'complete' will also include completely rethinking how they are designed where they cross paths. Union Square's intersections are currently designed in favor of keeping cars moving and reducing delay. Slip lanes, right turn signals, long pedestrian delays, and wide turning radii unnecessarily dominate the existing streetscape at the expense of pedestrians.

Converting redundant, inefficient, or underused street space into people space is one of the most valuable outcomes of our Complete Streets policy and its pedestrian-first planning. The existing street network in the Union Square plan area represents 91.63 acres, or 22.53% of the total plan area. Much of this land area is made up of intersections that dedicate significant amounts of space to vehicular travel and turning lanes, but many of these vehicles are simply passing through the square to get to other places. The City is in the advanced design stages to convert Webster Avenue and Prospect Street to two-way traffic, and this Plan identifies the conversion of Somerville Avenue to two-way traffic as a priority for the city (see page 140 for more information). By removing the one-way loops that force all drivers onto the same street segments, these changes will drastically improve the experience of driving through Union Square and set the stage for repurposing underutilized roadways to create more capacity for people. The pages that follow identify the possibilities.





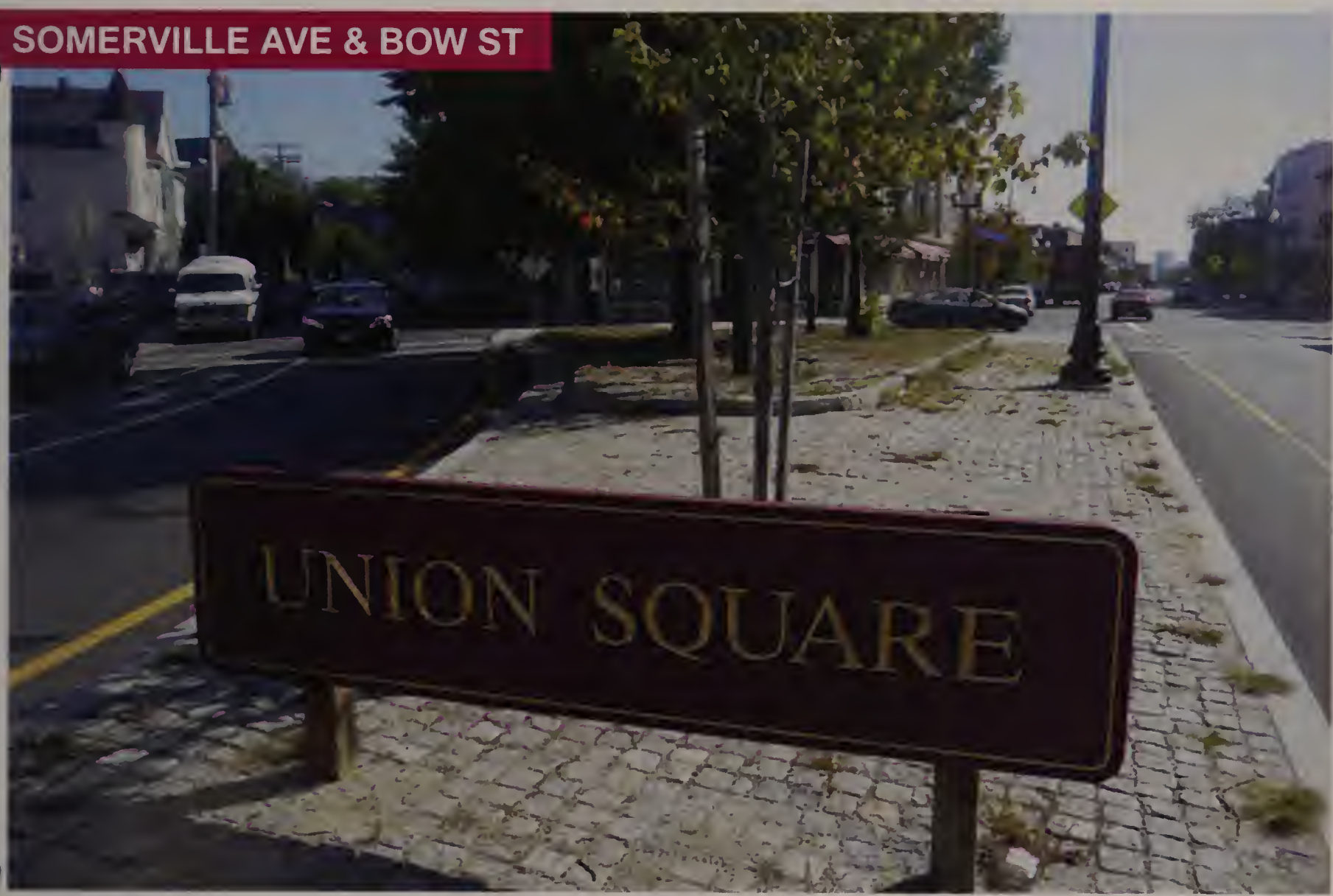
The intersection of Lincoln, Wellington, and Southport in Chicago is now called *Lincoln Hub* after a placemaking project sponsored by the Chamber of Commerce used simple flexible bollards and painted curb extensions to transform the intersection into a destination rather than a place for passing through to other locations outside the neighborhood

TOP: The Lincoln Hub installation combines traffic calming, pedestrian improvements and public art to create a memorable focal point

LEFT: The design of Lincoln Hub's polka-dot pattern is intended to suggest an oriental rug, referencing the hubs carpet stores

RIGHT: Painted curb extensions expand the protected area of the sidewalk and shorten street-crossing distances for pedestrians

SOMERVILLE AVE & BOW ST

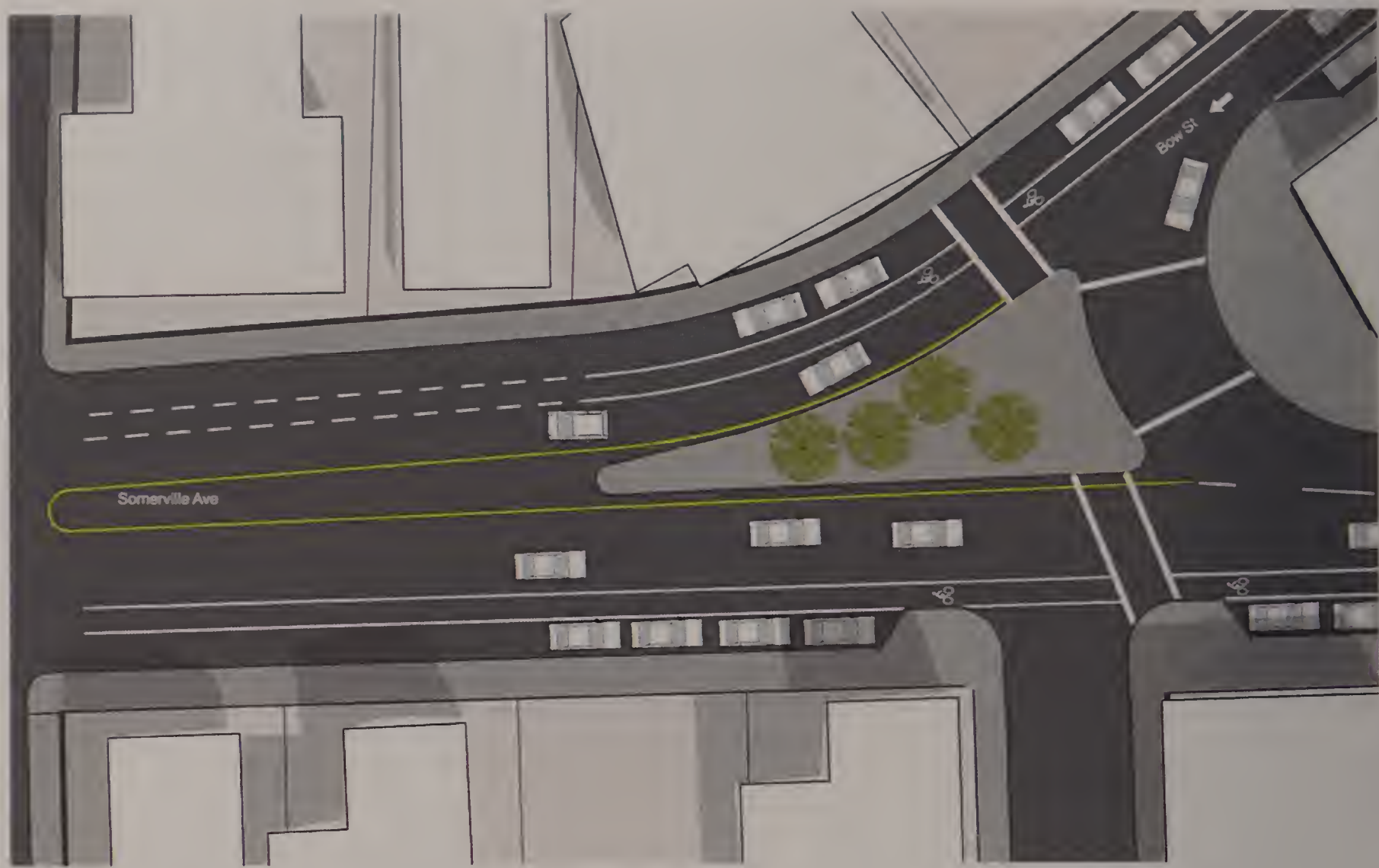


The Somerville Avenue to Bow Street intersection favors the automobile. If you're traveling east, or into the square, the Union Square sign welcomes you. If you're headed west, drivers feel the relief that they have finally gotten through Union Square traffic and can go on to their destination. The intersection uses what's called a slip lane, a travel lane that allows vehicles to turn without ever having to enter an intersection. This allows vehicles to travel at greater speeds.

The remaining space is a traffic island or a place for pedestrians to stand. However, it doesn't even do a good job at that. The pavement is rough cobblestones and there's a curb around a grove of four trees, the only current asset of the space. There are no benches, the cobblestones can hurt feet, and traffic whizzes by – try to enjoy it. If curious enough, some pedestrians might put up with the cobblestones long enough to read the story of Jonathan Niles. Niles worked at the Bleachery long ago and discovered the fossil of a dinosaur close to the location of the sign in the island. He put it on display in his home in Boston and charged people to come and view the specimen. However, it was determined to be a hoax, the fossil was a collection of dog and horse bones.

If Somerville Avenue is turned back into a two-way street, there is opportunity to reclaim space because the existing traffic pattern will not work. Cars coming from Bow Street will have to coordinate with cars on Somerville Avenue whereas before Bow Street was the start of the two-way Somerville Avenue. Bow Street, Somerville Avenue, and Carlton Street intersect at the current traffic island. By straightening Bow Street, and eliminating the slip lane, to meet Carlton Street, the reclaimed space can be turned into a plaza and widened sidewalk.

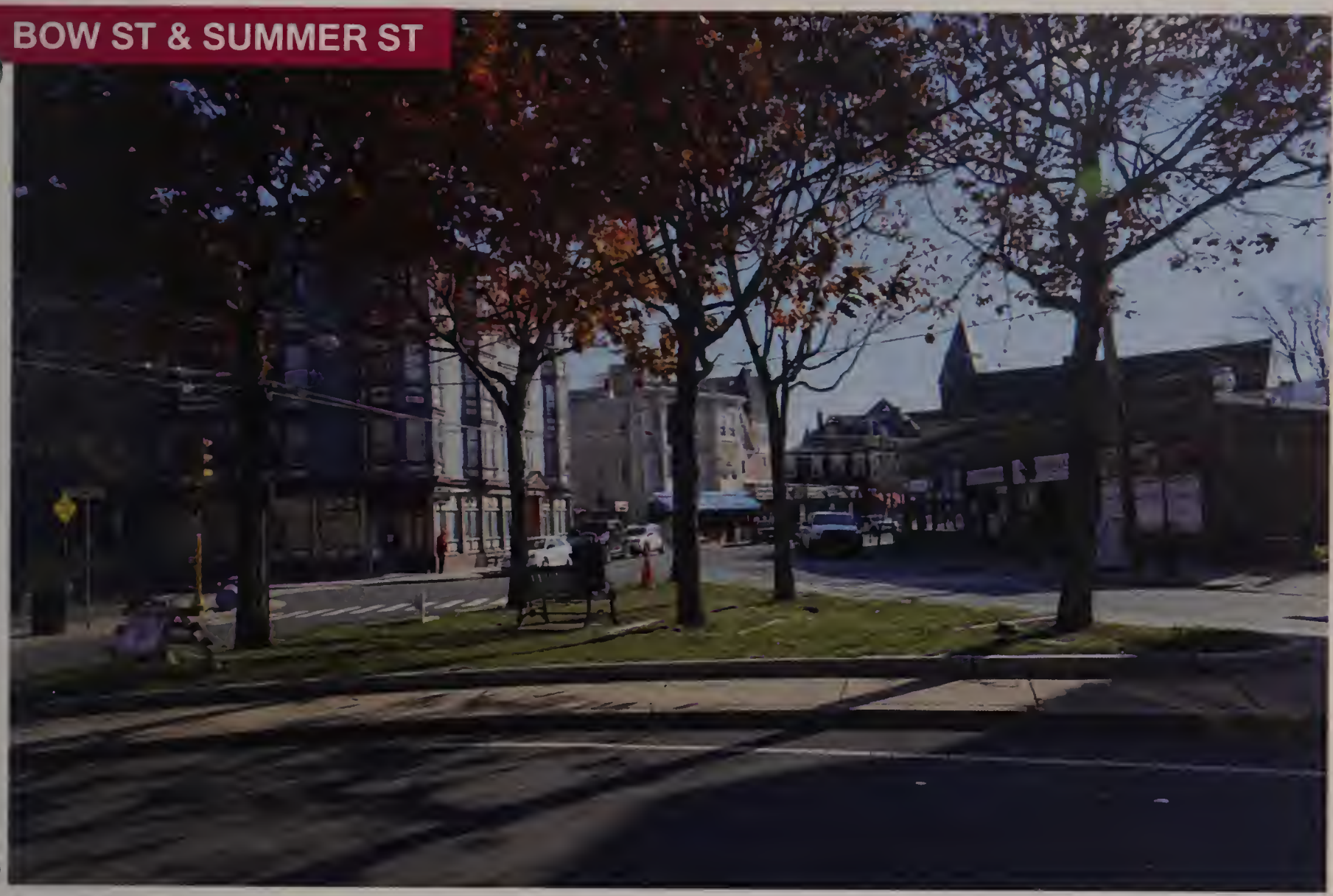
Both sides of the street, in front of the Drouet Block and the storefronts including Thunder Road, can benefit. The plazas give room back to people. Shops could spill out onto the street, people can enjoy a book on a new bench, wait to see a show, or just pass through. Plazas are not just hardscape either. They give opportunity for new trees and planting areas. Hint, hint bulb blitzers!



ABOVE: The intersection of Somerville Avenue and Bow Street serves as the western gateway for Union Square but the sign in the traffic island is the only marker.

BELOW: Somerville Avenue and Bow Street can serve as a real gateway. More than a sign, plazas, and the people using them, will signify the arrival to Union Square.

BOW ST & SUMMER ST



The intersection of Bow and Summer Street is wide and paved. There are painted lines and black lines painted over some of those lines but it doesn't get the job done. The Summer and Bow Street intersection has been divided into two shortcuts, or slip lanes, which are helpful to motorists because they can travel at higher speeds. Cars look to disappear quickly up Summer Street. Inbound traffic can attempt a full speed merge with Bow Street vehicles, across a bicycle lane. Cyclist have it especially tough at this intersection because they have the right-of-way to stay on Bow Street. However, the slip lane essentially makes staying on the same street a left turn across a lane of fast moving traffic.

The eased turns created by the natural bend in the road and slip lanes have decreased safety for pedestrians because drivers cannot see far ahead. Each crosswalk is signalized. If pedestrians can't cross in the time allowed, pedestrians can take refuge on the traffic island. The triangular island has sidewalks on all edges and a curb demarking a landscaped area. There are five existing trees and one bench. Have you ever seen someone sitting on the bench? The granite curbing and change in grade is similar to the demarcation of public and private space in residential areas. Think of a homeowner with a short kneewall and lush grassed front yard. It's accessible but social norms stop a passerby from stopping to sit. This treatment of public space still psychologically triggers the same reactions as those residential areas, this area is to be viewed from the outside rather than experienced and enjoyed.

The redesign of the Bow and Summer Street intersection is intended to reverse the current experience and give space back to people. This plaza is the bookend of the Bow Street shared space. The slip lanes for Summer Street are eliminated. Summer Street now intersects with Bow Street at a raised intersection. Without the slip lanes, there's room for extended sidewalks and street trees in front of 39 Bow Street, the brick apartment building. In front of 1 Summer Street, the former Gothic church, there's area for a large plaza.

Plazas can provide for a variety of activities and uses. Plazas will even change throughout the day. This plaza may see a spillover of activity in the mornings from the Saturday farmer's market and nearby breakfast eateries. In the afternoon and evenings, it might transition to a more passive space. Plazas will also give opportunity for trees and planted areas, bike parking, and seating to name a few.

ABOVE: The intersection of Bow and Summer Street is confusing. Cars entering Summer Street can do so quickly and in a straight shot but have to yield to cyclists. Cars can enter Bow Street from Summer Street without stopping. The majority of pedestrian crossings are signalized because of the roadway.

BELOW: The Bow and Summer Street intersection will be the bookend to the Bow Street shared space. The intersection does not have to create conflicts between pedestrians, cyclists, and cars. The plaza is an added plus!

WASHINGTON & WEBSTER

This intersection is considered one of the worst to experience in Union Square. Consistently, community members highlight this intersection as poor for pedestrians, complex for cyclists, and frustrating for drivers. There's two slip lanes, a traffic lane that allows vehicles to turn at an intersection without actually entering the intersection, connecting Somerville Avenue to Bow Street in different locations. There's also an eased right turn allowing cars to turn at higher speeds from Somerville Avenue to Washington Street. The most confusing part of the intersection is the left turn to stay on Somerville Avenue.

Pedestrians are relegated to narrow sidewalks, medians, and traffic islands. The sidewalk is the narrowest on the southern side of Somerville Avenue. The medians that are intended only to separate traffic of different directions are used by pedestrians to hop across the intersection as traffic and pedestrian signals allow. The medians are not wide enough to provide handicap access ramps up onto them so the medians are cut. This makes the crosswalk level and accessible which is very important but keeps the pedestrian on the same level as vehicles which decreases visibility.

A primary goal of redesigning the intersection is to provide shorter and safer pedestrian crossings so that people on foot can more easily navigate through the center of the neighborhood. The redesign should also improve connectivity for motorists and cyclists, eliminating confusion, and improving predictability through the square.

The biggest concept is the direct connection of Somerville Avenue through the intersection which creates a strong east-west route. This improves connectivity for all modes. Washington Street and Webster Avenue can be treated as the third and fourth legs of a four-way intersection. Instead of entering Bow Street through a slip lane, Bow Street is now accessed by turning off of Somerville Avenue. This helps to keep through traffic on Somerville Avenue and local, slower moving traffic on Bow Street. This solution is elegant in its simplicity, making the intersection more intuitive for drivers while creating substantially more public space.

By realigning the streets, 19,602 square feet of space is given back to pedestrians. There are plazas in front of redevelopment parcel D7 and Reliable Market; Mid-Nite Convenience and Mama Gina's Pizza, and Gracie's Ice Cream and Machu Chicken. The intersection is elevated to give priority to pedestrians and help to slow car travel. Elevating the street here also connects these new and improved plazas to the main plaza along Somerville Avenue creating a unified square that, from building face to building face, celebrates this area as a public square that safely moves cars, pedestrians, and cyclists.

ABOVE: This intersection is considered one of the worst to experience in Union Square - poor for pedestrians, complex for cyclists, and frustrating for drivers.

BELOW: Somerville Avenue can connect through the Square to create a strong east-west connection. Additional space is given back to pedestrians including increased sidewalk widths and new plazas.

2016 David Carrico

UNION SQUARE PLAZA

Today, the square is consistently recognized as the social and cultural center of the neighborhood. The Union Square plaza was created when Washington Street was reconfigured to meet Prospect Street in the 1960's. The plaza has since become the hub to Union Square hosting events like the Saturday Farmer's Market, Pity Party, the Fluff Festival, and outdoor dining for several restaurants. Most activities are squished into the existing condition while the blacktop expanse looms near.

For such loved space, only a fraction of the plaza can be easily accessed for public activities. The current design limitations are significant. Pedestrians can only use the parking area during events. When it is closed, there's a tripping hazard in the change of grade. People are having too much fun to look down! The plaza has an elevated 6" curb surrounding two existing groves of trees and the land area under these trees is finished in rough cobblestones. This design element discourages any public use of this space. The curb signifies that this is an area to look at, not enjoy. The cobblestones are uncomfortable to stand on too.

Any redesign should prioritize the use of the space by people. With Somerville Avenue realigned, the plaza can be extended and 'filled in' in areas currently devoted to vehicular traffic. New materials and landscaping in the existing plaza can increase the usability. Paving materials should be seamlessly transitioned and landscaped areas should be flush with the plaza level. This will be more inviting for users and they might actually sit and enjoy the area under the trees.

The parking spaces that are currently accessed from Washington Street don't need to be removed, but the parking area needs to be rethought of as a public space that is parked on when it isn't being used for events. Seen this way, it becomes a part of the plaza. This mindset has already started with The Independent's dining deck. To make this change, the parking area would be elevated to the same height as the existing plaza with similar materials. The plaza area and parking area could then be delineated by bollards or similar penetrable barriers to protect the pedestrians when cars are in the parking area. This allows the area to be flexible and meet the needs of both uses.

ABOVE: The Union Square Plaza is mostly parking. Users are pinned into the remaining space and squeezed onto a narrow sidewalk where the plaza ends.

BELOW: This concept illustrates the possibilities. All of the uses and activities that happen on the plaza today remain, but a more efficient layout and uniform design can make the plaza more flexible to meet different needs throughout the day

Greenhouse Gas

APPENDIX E GREENHOUSE GAS ANALYSIS

E.1 Revised Modeling Input

E.2 Modeling Output (Revised Envelopes Only)

Model Group 4

Model Group 5

Model Group 6

E.3 Passive House Study

E.4 Electrification Study

E.5 Electric Modeling Output (New Electric Alternatives Only)

Model Group 3

Model Group 4

Model Group 5

E.6 Solar Study

E.1 Revised Modeling Input

Location	Somerville, MA
Climate Zone	5A
Baseline	ASHRAE 90.1-2013 Appendix G
Simulation Software	eQUEST 3.64

Model Group	Building	Building Type	Modeled Building Area	Floors	Underground Parking	Modeled Parking Area	Baseline Adjustments	
1	D2.1	Large Lab/Office/Retail	198,914	7			Energy Efficient HVAC	Reduced LPD
2	D1.2	Large Office/Retail	196,349	10	Garage - Above Grade	155,443	Energy Efficient HVAC	Reduced LPD
3	D6.1	Medium Office/Retail	111,564	5	Garage - Below Grade	25,662	Energy Efficient HVAC	Reduced LPD
4	D4.1	Small Office/Retail	29,767	4			Energy Efficient HVAC	Reduced LPD
5	D1.1	Midrise Hotel/Retail	111,358	5	Garage - Below Grade	28,251	Energy Efficient HVAC	Reduced LPD
6	D2.2-3	Large Residential/Retail	394,694	25	Garage - Above Grade	114,324	Dedicated Outdoor Air System	Reduced LPD
7	D3.2	Large Residential/Retail	144,553	24			Energy Efficient HVAC	Reduced LPD
8	D4.3	Midrise Residential/Retail	61,307	4			Energy Efficient HVAC	Reduced LPD

Model Group	Building	Building Type	Primary HVAC System	Secondary HVAC System	Fan Control and Power	Cooling Source and Efficiency	Heating Source and Efficiency	Pumping Control and Power	Ventilation	Energy Recovery	LPD [W/SF]	Daylighting Controls	Plug/Process Loads [W/SF] or as noted	DHW	Infiltration	Opaque Wall	Opaque Roof	Opaque Floor	Opaque Slab	Window WWR	Window U-Factor	Window SHGC	Window VT
					Proposed Design																		
1	D2.1	Large Lab/Office/Retail	Lab: VAV with Reheat	Office: Fan Coil Retail: Fan Coil Penthouse: H&V	Lab: VAV 0.002507 kW/CFM Office: CAV 0.000500 kW/CFM Retail: CAV 0.000500 kW/CFM Penthouse: CAV 0.000800 kW/CFM	All: Chilled Water 6.01 COP Condenser Water: Open Tower 40.2 GPM/HP	All: Hot Water - Fossil Fuel 95%	Hot Water: Variable Flow 18.6 W/GPM Chilled Water: Variable Flow 21.7 W/GPM Condenser Water: Variable Flow 15.8 W/GPM	Lab: 145,850 CFM (Max Cooling) 122,000 CFM (Minimum) Office: 7,800 CFM Retail: 3,850 CFM Penthouse: 10,000 CFM	Lab/Office System: Runaround Loop 30% Effectiveness	Office: 0.615 Retail: 0.945	Same as Baseline	Same as Baseline	All: Electric Storage 96% Ef Low flow fixtures	Same as Baseline	Opaque: U-0.047 Spandrel: U-0.188	U-0.032	U-0.047	Same as Baseline	37%	0.388	0.245	0.39
2	D1.2	Large Office/Retail	Office: VAV AHU with Reheat (FPB in perimeter)	Retail: Packaged RTU	Office AHU: VAV 0.001100 kW/CFM Retail Packaged RTU: CAV 0.000850 kW/CFM	Office AHU: Chiled Water: 6.10 COP Retail Packaged RTU: DX:11.0 EER and 14 SEER	Preheat: Office: Condensing Fossil Fuel Boiler 95% Retail: Fossil Fuel Furnace 80%	Hot Water: Variable Flow 19.0 W/GPM	Same as Baseline	Office: Enthalpy Wheel 70% Effectiveness Retail: Sensible Plate 60% Effectiveness	Office: 0.615 Retail: 0.945 Parking: 0.10	Same as Baseline	Same as Baseline	Office: Gas Condensing Storage 95% Ef Retail: Electric Storage 96% Ef Low flow fixtures	Same as Baseline	Opaque: U-0.040, 50% Spandrel: U-0.125, 10%	U-0.032	U-0.038	Same as Baseline	40%	0.42	0.26	0.286
3	D6.1	Medium Office/Retail	Office: Packaged VAV with Reheat (FPB in perimeter)	Retail: Packaged VAV with Reheat	Office/Retail Pachaged VAV: VAV 0.001100 kW/CFM Retail Packaged RTU: CAV 0.000850 kW/CFM	Office/Retail Pachaged VAV: DX:11 EER	Preheat: All: Fossil Fuel Furnace 80% Reheat: Condensing Fossil Fuel Boiler 95%	Hot Water: Variable Flow 19.0 W/GPM	Same as Baseline	Office Enthalpy Wheel 70% Effectiveness Retail: Sensible Plate 70% Effectiveness	Office: 0.615 Retail: 0.945 Parking: 0.10	Same as Baseline	Same as Baseline	Office: Gas Condensing Storage 95% Ef Retail: Electric Storage 96% Ef Low flow fixtures	Same as Baseline	Opaque: U-0.040, 50% Spandrel: U-0.125, 10%	U-0.032	U-0.038		40%	0.42	0.26	0.286
4	D4.1	Small Office/Retail	Office: Packaged VAV with Reheat (FPB in perimeter)	Retail: Packaged RTU	Office Packaged VAV: VAV 0.001100 kW/CFM Retail Packaged RTU: CAV 0.000850 kW/CFM	Office/Retail: DX:11 EER	Preheat: Office/Retail: Fossil Fuel Furnace 80% Reheat: Condensing Fossil Fuel Boiler 95%	Hot Water: Variable Flow 19.0 W/GPM	Same as Baseline	Office: Enthalpy Wheel 70% Effectiveness Retail: Sensible Plate 60% Effectiveness	Office: 0.615 Retail: 0.945	Same as Baseline	Same as Baseline	All: Electric Storage 96% Ef Low flow fixtures	Same as Baseline	Opaque: U-0.040, 56% Spandrel: U-0.125, 10%	U-0.032	-	Same as Baseline	34%	0.388	0.26	0.286
5	D1.1	Midrise Hotel/Retail	Hotel: Vertical WSHP	Retail: Horizontal WSHP Hotel ERV: DOAS	Hotel WSHP: CAV 0.000500 kW/CFM Retail WSHP: CAV 0.000500 kW/CFM Hotel ERV: CAV 0.001000 kW/CFM	Hotel: Heat Pump 15.5 EER Retail: Heat Pump 16.5 EER Hotel ERV: DX 9.8 EER Condenser Water: Open Tower 40.2 GPM/HP	Hotel: Heat Pump 3.0 COP Retail: Heat Pump 5.50 COP Hotel ERV Furnace 80% Condenser Water: Fossil Fuel Boiler 93%	Condenser Water: Variable Flow 19.0 W/GPM	Same as Baseline	Hotel ERV: DOAS - Enthalpy Wheel 60% Effectivenea	Hotel: 0.74 Retail: 0.945 Parking: 0.10	Same as Baseline	Same as Baseline	All: Gas Condensing Storage 95% Ef Low flow fixtures	Same as Baseline	U-0.040	U-0.032	U-0.038	-	40%	0.388	0.4	0.44
6	D2.2-3	Large Residential/Retail	Resi Tower: Vertical WSHP Resi Bar: Aquatherm	Retail: Horizontal WSHP BOH Tower: Horizontal WSHP BOH Bar: VRF Resi ERV Bar: DOAS with DX/NG Resi ERV Tower: DOAS with WSHP	Resi Tower: CAV 0.000500 kW/CFM Resi Bar Aquatherm: CAV 0.000600 kW/CFM Retail: CAV 0.000500 kW/CFM BOH Tower: CAV 0.000500 kW/CFM BOH Bar: CAV 0.000500 kW/CFM Resi ERV Bar DOAS: CAV 0.001717 kW/CFM Resi ERV Tower DOAS : CAV 0.001450 kW/CFM	Resi Tower: Heat Pump 15.5 EER Resi Bar Aquatherm: DX 16.0 SEER Retail: Heat Pump 16.5 EER BOH Tower: Heat Pump 16.5 EER BOH Bar: VRF 12.5 EER Resi ERV Bar DOAS: DX 13.0 EER Resi ERV Tower DOAS: Heat Pump 16.45 EER Condenser Water: Open Tower 40.2 GPM/HP	Resi Tower: Heat Pump 5.00 COP Resi Bar Aquatherm: Hot Water 93% Retail: Heap Pump 5.50 COP BOH Tower: Heat Pump 5.50 COP BOH Bar: VRF 3.47 COP Resi ERV Bar DOAS: Furnace 80% Resi ERV Tower DOAS: Heat Pump 3.93 COP Condenser Water: Fossil Fuel Boiler 93%	Condenser Water: Variable Flow 19.0 W/GPM Aquatherm: Constant Flow 25.2 W/GPM	Same as Baseline	Resi ERV Bar: DOAS - Enthalpy Wheel 73.1% Sensible, 70.8% Latant Resi ERV Tower: DOAS - Enthalpy Wheal 70.7% Sensible, 65.6% Latant	Dwelling Unit: 0.433 Dwelling Plug-in: 0.5 Retail: 0.945 Parking: 0.10	Same as Baseline	Same as Baseline	Retail/Resi: Gas Condensing Storage 97.5% Ef Lower Resi Bar: Tankless Gas Condensing 93% Ef Low flow fixtures	Same as Baseline	U-0.048	U-0.0286	-	Same as Baseline	40%	Fixed: 0.38 Operable: 0.45 Entrance: 0.77	0.35	0.44
7	D3.2	Large Residential/Retail	Resi Tower: Vertical WSHP Resi Bar: Aquatherm	Retail: Horizontal WSHP Office: Horizontal WSHP Resi ERV: DOAS with WSHP	Resi Tower: WSHP: CAV 0.000500 kW/CFM Resi Bar Aquatherm: CAV 0.000500 kW/CFM Retail WSHP: CAV 0.000500 kW/CFM Office WSHP: CAV 0.000500 kW/CFM Resi ERV: CAV 0.001000 kW/CFM	Resi Tower: Heat Pump 15.5 EER Resi Bar Aquatherm: DX 16.0 SEER Retail: Heat Pump 16.5 EER Office Heat Pump 16.5 EER Resi ERV: Heat Pump 16.5 EER Condenser Water: Open Tower 40.2 GPM/HP	Resi Tower: Heat Pump 5.50 COP Resi Bar Aquatherm: Hot Water 95% Retail: Heat Pump 5.50 COP Office Heat Pump 5.50 COP Resi ERV: Heat Pump 5.50 COP Condenser Water: Fossil Fuel Boiler 95%	Condenser Water: Variable Flow 20.0 W/GPM Aquatherm: Constant Flow 25.2 W/GPM	Same as Baseline	Resi ERV: DOAS - Enthalpy Wheel 70% Effectiveness	Dwelling Unit: 0.433 Dwelling Plug-in: 0.5 Retail: 0.945	Same as Baseline	Same as Baseline	Retail/Resi: Gas Condensing Storage 95% Ef Lower Resi Bar: Tankless Gas Condensing 95% Ef Low flow fixtures	Same as Baseline	U-0.040	U-0.032		Same as Baseline	40%	0.42	0.4	0.44
8	D4.3	Midrise Residential/Retail	Resi: Aquatherm	Retail: Packaged RTU Resi ERV: DOAS with DX/NG	Resi Aquatherm: CAV 0.000600 kW/CFM Retail Packaged RTU: CAV 0.000850 kW/CFM Resi ERV: CAV 0.001000 kW/CFM	Resi Aquatherm: DX 16.0 SEER Retail RTU: DX:11 EER Resi ERV: DX 11 EER Condenser Water: Open Tower 40.2 GPM/HP	Resi Aquatherm: Fossil Fuel Boiler 95% Retail RTU: Furnace 80% Resi ERV: Furnace 95%	Aquatherm: Constant Flow 25.2 W/GPM	Same as Baseline	Resi ERV: DOAS - Enthalpy Wheel 70% Effectiveness	Dwelling Unit: 0.433 Dwelling Plug-in: 0.5 Retail: 0.945	Same as Baseline	Same as Baseline	Resi: Tankless Gas Condensing 95% Ef Retail: Electric Storage 93% Ef Low flow fixtures	Same as Baseline	U-0.048	U-0.032		Same as Baseline	40%	0.42	0.35	0.44

Model Group	Building	Building Type	Primary HVAC System	Secondary HVAC System	Fan Control and Power	Cooling Source	Heating Source	Pumping Power	Ventilation	Energy Recovery	LPD [W/SF]	Daylighting Controls	Plug/Process Loads [W/SF] or as noted	DHW	Infiltrasion	Opaque Wall	Opaque Roof	Opaque Floor	Opaque Slab	Window WWR	Window U-Factor	Window SHGC	Window VT
					ASHRAE 90.1-2013 - Appendix G Baseline																		
1	D2.1	Large Lab/Office/Retail	Lab/Office/Retail: System 7 - VAV with Reheat	Penthouse and Heating Only: System 9 - H&V	Lab/Office: VAV 0.001610 kW/CFM Retail: CAV 0.001218 kW/CFM Penthouse/Heating Only: CAV 0.000800 kW/CFM*	Lab/Office, Chilled Water 6.61 COP CW - Open Tower 40.2 GPM/HP	All: Hot Water - Fossil Fuel 88%	Hot Water: Variable Flow 19.0 W/GPM Chilled Water: Constant Flow Primary, Variable Flow Secondary 22.0 W/GPM Condenser Water: Variable Flow 19.0 W/GPM	Lab: 122,000 CFM Office: 7,800 CFM Retail: 3,850 CFM Penthouse: 10,000 CFM	No	Office: 0.738 Retail: 1.134	Yes	Lab: 4.0 Process Condenser Loop: 150 Tons Office: 0.75 Retail: 0.25 Kitchen: 120 kW, 750 MBH	All: Electric Storage 96% Ef Standard flow fixtures	0.023 CFM/SF	R13+R-10 c.i. (U-0.055)	R-30 c.i. (U-0.032)	R-30 (U-0.038)	R-15 for 24in. (F-0.520)	37%	0.42	0.40	Same as Proposed
2	D1.2	Large Office/Retail	Office: System 7 - VAV with Reheat	N/A	All: VAV 0.001299 kW/CFM*	All: Chilled Water 5.76 COP CW - Open Tower 40.2 GPM/HP	All: Hot Water - Fossil Fuel 88%	Hot Water: Variable Flow 19.0 W/GPM Chilled Water: Constant Flow Primary, Variable Flow Secondary 22.0 W/GPM Condenser Water: Variable Flow 19.0 W/GPM	Office: 28,000 CFM Retail: 3,600 CFM	No	Office: 0.738 Retail: 1.134	Yes	Office: 0.75 Retail: 0.25	All: Electric Storage 96% Ef Standard flow fixtures	0.026 CFM/SF	R13+R-10 c.i. (U-0.055)	R-30 c.i. (U-0.032)	R-30 (U-0.038)	R-15 for 24in. (F-0.520)	40%	0.42	0.40	Same as Proposed
3	D6.1	Medium Office/Retail	Office/Retail: System 5 - Packaged VAV with Reheat	N/A	All: VAV 0.001313 kW/CFM*	All: DX 10.17 EER*	Office: Hot Water - Fossil Fuel 88% Retail: Fossil Fuel Furnace 88%	Hot Water: Constant Flow 19.0 W/GPM	Office: 11,650 CFM Retail: 5,350 CFM	Yes (GVAV system only due to fraction of OA and airflow CFM)	Office: 0.738 Retail: 1.134 Parking: 0.189	Yes	Office: 0.75 Retail: 5.0	All: Electric Storage 96% Ef Standard flow fixtures	0.027 CFM/SF	R13+R-10 c.i. (U-0.055)	R-30 c.i. (U-0.032)	R-30 (U-0.038)	-	40%	0.42	0.40	Same as Proposed
4	D4.1	Small Office/Retail	Office: System 5 - Packaged VAV with Reheat	N/A	Office: VAV 0.001245 kW/CFM	Office: DX 11 EER*	Office: Hot Water - Fossil Fuel 88%*	Hot Water: Constant Flow 19.0 W/GPM	Office: 2,850 CFM Retail: 1,600 CFM	No	Office: 0.738 Retail: 1.134	Yes	Office: 0.75 Retail: 0.25	All: Electric Storage 96% Ef Standard flow fixtures	0.043 CFM/SF	R13+R-10 c.i. (U-0.055)	R-30 c.i. (U-0.032)	-	R-15 for 24in. (F-0.520)	31%	0.42	0.40	Same as Proposed
5	D1.1	Midrise Hotel/Retail	All: System 1 - PTAC	N/A	All: CAV 0.000300 kW/CFM	All: DX 9.5 EER*	All: Hot Water - Fossil Fuel 88%	Hot Water: Constant Flow 19.0 W/GPM	Hotel: 11,400 CFM Retail: 3,550 CFM	No	Hotel: 0.783 Retail: 1.134 Parking: 0.189	No	Hotel: 1.0 Retail: 0.25	Hotel: Gas Storage 80% Retail: Electric Storage 96% Ef Standard flow fixtures	0.036 CFM/SF	R13+R-10 c.i. (U-0.055)	R-30 c.i. (U-0.032)	R-30 (U-0.038)	-	34%	0.42	0.40	Same as Proposed
6	D2.2-3	Large Residential/Retail	Resi: System 1 - PTAC	BOH: System 5 - Packaged VAV with Reheat Retail: System 3 - PSZ-AC Heating Only: System 9 - H&V Resi Bar ERV: DOAS Resi Tower ERV: DOAS	Resi: CAV 0.000500 kW/CFM BOH: VAV 0.001651 kW/CFM* Retail: CAV 0.000802 kW/CFM* Heating Only: CAV 0.000500 kW/CFM* Resi Bar ERV: CAV 0.000851 kW/CFM Resi Tower ERV: CAV 0.000641 kW/CFM	Resi: DX 9.5 EER* BOH: DX 10 EER* Retail: DX 10 EER* Resi Bar ERV: DX 9.5 EER Resi Tower ERV: DX 9.5 EER	Resi, BOH, Heating Only: Hot Water - Fossil Fuel 80% Retail: Fossil Fuel Furnace 80% Resi Bar ERV: Fossil Fuel Furnace 80% Resi Tower ERV: Fossil Fuel Furnace 80%	Hot Water: Variable Flow 19.0 W/GPM	Resi: 38,550 CFM Retail: 5,500 CFM	Resi ERV: Enthalpy Wheel 50% Effectiveness	Dwelling Unit: 0.459 Plug-in: 0.5 Retail: Retail: 1.134 Parking: 0.10	No	Resi: 1.25 Retail: 5.0 BOH: 1.0	Resi: Gas Storage 80% Retail: Electric Storage 96% Ef Standard flow fixtures	0.023 CFM/SF	R13+R-10 c.i. (U-0.055)	R-30 c.i. (U-0.032)		R-15 for 24in. (F-0.520)	40%	0.42	0.40	Same as Proposed
7	D3.2	Large Residential/Retail	All: System 1 - PTAC	Office/Retail: System 5 - Packaged VAV with Reheat	Resi: CAV 0.000500 kW/CFM Office/Retail: VAV 0.001302 kW/CFM*	Resi: DX 10.45 EER* Office/Retail: DX 10.45 EER	All: Hot Water - Fossil Fuel 88%	Hot Water: Variable Flow 19.0 W/GPM	Resi: 37,200 CFM Retail: 3,000 CFM Office: 2,000	No	Dwelling Unit: 0.459 Plug-in: 0.5 Retail: 1.134 Office: 0.738	Yes	Resi: 1.25 Retail: 5.0 Office: 0.75	Resi: Gas Storage 80% Retail: Electric Storage 100% Ef Standard flow fixtures	0.021 CFM/SF	R13+R-10 c.i. (U-0.055)	R-30 c.i. (U-0.032)		R-15 for 24in. (F-0.520)	40%	0.42	0.40	Same as Proposed

8	D4.3	Midrise Residential/Retail	All: System 1 - PTAC	N/A	All: CAV 0.000300 kW/CFM	All: DX 10.45 EER*	All: Hot Water - Fossil Fuel 88%	Hot Water: Constant Flow 19.0 W/GPM	Resi: 5,100 CFM Retail: 2,250 CFM	No	Dwelling Unit: 0.459 Plug In: 0.5 Retail: Retail: 1.134	No	Resi: 1.25 Retail: 0.25	Resi: Gas Storage 80% Retail: Electric Storage 96% Et Standard flow fixtures	0.030 CFM/SF	R13+R-10 c.i. (U-0.055)	R-30 c.i. (U-0.032)	-	R-15 for 24in. (F-0.520)	40%	0.42	0.40	Same as Proposed

*Average Value

Model Group	Building	Alternative 1	Roof
1	D2.1	Improved Roof	U-0.025
2	D1.2	Improved Roof	U-0.025
3	D6.1	Improved Roof	U-0.025
4	D4.1	Improved Roof	U-0.025
5	D1.1	Improved Roof	U-0.025
6	D2.2-3	Improved Roof	U-0.025
7	D3.2	Improved Roof	U-0.025
8	D4.3	Improved Roof	U-0.025

Model Group	Building	Alternative 2	Wall	Glazing U-Factor	WWR
1	D2.1	Improved Envelope	U-0.031	-	-
2	D1.2	Improved Envelope	U-0.031	-	-
3	D6.1	Improved Envelope	U-0.031	-	-
4	D4.1	Improved Envelope	U-0.031	-	-
5	D1.1	Improved Envelope	U-0.031	-	30%
6	D2.2-3	Improved Envelope	-	Fixed: 0.23 Operable: 0.28	37%
7	D3.2	Improved Envelope	U-0.031	-	-
8	D4.3	Improved Envelope	U-0.031	-	-

Model Group	Building	Alternative 3	Mechanical System Options	DHW Options	CHP
1	D2.1	Proposed Envelope - Mech	Chilled Beams	-	Study
2	D1.2	Proposed Envelope - Mech	Chilled Beams	-	Study
3	D6.1	Proposed Envelope - Mech	VRF w/ DOAS	-	-
4	D4.1	Proposed Envelope - Mech	VRF w/ DOAS	-	-
5	D1.1	Proposed Envelope - Mech	VRF w/ DOAS	-	Study
6	D2.2-3	Proposed Envelope - Mech	D2.2-3 VRF w/ DOAS	D2.2: Heat pump storage	Study
7	D3.2	Proposed Envelope - Mech	Low-rise: VRF w/ DOAS	Low rise: Heat pump storage	Study
8	D4.3	Proposed Envelope - Mech	VRF w/ DOAS	Heat pump storage	-

E.2 Modeling Output (Revised Envelopes Only)

Model Group 4

Model Group 5

Model Group 6

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	160.5	0.0	422.6	0.0	120.6	0.0	16.1	201.3	0.0	0.0	27.7	0.0	948.9
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	510.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	510.8
MBTU	160.5	0.0	422.6	510.8	120.6	0.0	16.1	201.3	0.0	0.0	27.7	0.0	1459.8

TOTAL SITE ENERGY 1459.75 MBTU 49.0 KBTU/SQFT-YR GROSS-AREA 49.0 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 3357.58 MBTU 112.8 KBTU/SQFT-YR GROSS-AREA 112.8 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.19
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 134

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

US2 - D4.1 ENVELOPE CHANGES DOE-2.2-47h2 4/16/2019 7:58:46 BDL RUN 1
PROPOSED - FINAL WEATHER FILE- Boston MA TMY2
REPORT- BEPU Building Utility Performance

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY KWH	47033.	0.	123830.	0.	35335.	0.	4728.	58978.	0.	0.	8127.	0.	278031.
FM1 NATURAL-GAS THERM	0.	0.	0.	5108.	0.	0.	0.	0.	0.	0.	0.	0.	5108.

TOTAL ELECTRICITY	278031. KWH	9.340 KWH	/SQFT-YR GROSS-AREA	9.340 KWH	/SQFT-YR NET-AREA
TOTAL NATURAL-GAS	5108. THERM	0.172 THERM	/SQFT-YR GROSS-AREA	0.172 THERM	/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.19
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 134

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

US2 - D4.1 ENVELOPE CHANGES DOE-2.2-47h2 4/16/2019 7:58:46 BDL RUN 1
PROPOSED - FINAL
REPORT- PS-F Energy End-Use Summary for EM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
KWH	4320.	0.	10472.	0.	1.	0.	452.	4487.	0.	0.	673.	0.	20405.
MAX KW	17.935	0.000	30.899	0.000	0.017	0.000	0.976	16.922	0.000	0.000	2.811	0.000	56.050
DAY/HR	4/17	0/ 0	2/ 9	0/ 0	4/10	0/ 0	28/ 9	31/ 7	0/ 0	0/ 0	26/13	0/ 0	4/17
PEAK ENDUSE	17.935	0.000	26.801	0.000	0.000	0.000	0.704	8.459	0.000	0.000	2.151	0.000	
PEAK PCT	32.0	0.0	47.8	0.0	0.0	0.0	1.3	15.1	0.0	0.0	3.8	0.0	
FEB													
KWH	3695.	0.	9464.	0.	0.	0.	396.	3999.	0.	0.	609.	0.	18164.
MAX KW	16.294	0.000	30.899	0.000	0.018	0.000	0.995	17.188	0.000	0.000	2.811	0.000	54.315
DAY/HR	27/17	0/ 0	1/ 9	0/ 0	16/10	0/ 0	1/ 9	2/ 7	0/ 0	0/ 0	23/13	0/ 0	5/17
PEAK ENDUSE	16.202	0.000	26.801	0.000	0.000	0.000	0.700	8.459	0.000	0.000	2.151	0.000	
PEAK PCT	29.8	0.0	49.3	0.0	0.0	0.0	1.3	15.6	0.0	0.0	4.0	0.0	
MAR													
KWH	4048.	0.	10657.	0.	6.	0.	406.	4134.	0.	0.	693.	0.	19944.
MAX KW	17.100	0.000	30.899	0.000	5.804	0.000	0.984	16.414	0.000	0.000	2.811	0.000	55.169
DAY/HR	5/17	0/ 0	1/ 9	0/ 0	27/18	0/ 0	10/ 8	11/ 7	0/ 0	0/ 0	1/13	0/ 0	5/17
PEAK ENDUSE	17.100	0.000	26.801	0.000	0.000	0.000	0.657	8.459	0.000	0.000	2.151	0.000	
PEAK PCT	31.0	0.0	48.6	0.0	0.0	0.0	1.2	15.3	0.0	0.0	3.9	0.0	
APR													
KWH	3740.	0.	10250.	0.	222.	0.	356.	3843.	0.	0.	676.	0.	19087.
MAX KW	13.264	0.000	30.899	0.000	17.040	0.000	1.422	12.690	0.000	0.000	2.811	0.000	68.521
DAY/HR	20/11	0/ 0	2/ 9	0/ 0	18/16	0/ 0	18/12	2/ 7	0/ 0	0/ 0	5/13	0/ 0	18/17
PEAK ENDUSE	10.976	0.000	26.724	0.000	16.745	0.000	1.422	10.428	0.000	0.000	2.225	0.000	
PEAK PCT	16.0	0.0	39.0	0.0	24.4	0.0	2.1	15.2	0.0	0.0	3.2	0.0	
MAY													
KWH	3821.	0.	10639.	0.	2470.	0.	344.	4706.	0.	0.	708.	0.	22688.
MAX KW	12.006	0.000	30.899	0.000	31.180	0.000	1.422	19.814	0.000	0.000	2.811	0.000	91.178
DAY/HR	14/17	0/ 0	1/ 9	0/ 0	29/16	0/ 0	20/11	30/17	0/ 0	0/ 0	1/13	0/ 0	29/17
PEAK ENDUSE	11.052	0.000	26.724	0.000	30.752	0.000	1.422	19.004	0.000	0.000	2.224	0.000	
PEAK PCT	12.1	0.0	29.3	0.0	33.7	0.0	1.6	20.8	0.0	0.0	2.4	0.0	
JUN													
KWH	3620.	0.	10238.	0.	6055.	0.	395.	5933.	0.	0.	679.	0.	26919.
MAX KW	11.190	0.000	30.899	0.000	38.537	0.000	1.422	22.446	0.000	0.000	2.811	0.000	102.083
DAY/HR	26/17	0/ 0	1/ 9	0/ 0	11/16	0/ 0	1/10	11/16	0/ 0	0/ 0	4/13	0/ 0	11/17
PEAK ENDUSE	10.877	0.000	26.724	0.000	38.474	0.000	1.422	22.363	0.000	0.000	2.223	0.000	
PEAK PCT	10.7	0.0	26.2	0.0	37.7	0.0	1.4	21.9	0.0	0.0	2.2	0.0	
JUL													
KWH	3716.	0.	10449.	0.	10898.	0.	483.	7411.	0.	0.	690.	0.	33647.
MAX KW	11.174	0.000	30.899	0.000	42.261	0.000	1.422	22.973	0.000	0.000	2.811	0.000	105.685
DAY/HR	31/10	0/ 0	2/ 9	0/ 0	20/16	0/ 0	2/21	20/15	0/ 0	0/ 0	5/13	0/ 0	20/17
PEAK ENDUSE	10.870	0.000	26.724	0.000	42.246	0.000	1.422	22.200	0.000	0.000	2.223	0.000	
PEAK PCT	10.3	0.0	25.3	0.0	40.0	0.0	1.3	21.0	0.0	0.0	2.1	0.0	
AUG													
KWH	3876.	0.	10829.	0.	9547.	0.	433.	6966.	0.	0.	719.	0.	32369.
MAX KW	12.986	0.000	30.899	0.000	36.950	0.000	1.422	21.704	0.000	0.000	2.811	0.000	100.139
DAY/HR	9/10	0/ 0	1/ 9	0/ 0	23/16	0/ 0	1/15	29/15	0/ 0	0/ 0	8/13	0/ 0	28/14
PEAK ENDUSE	10.675	0.000	27.108	0.000	36.623	0.000	1.422	21.504	0.000	0.000	2.807	0.000	
PEAK PCT	10.7	0.0	27.1	0.0	36.6	0.0	1.4	21.5	0.0	0.0	2.8	0.0	

SEP													
KWH	3659.	0.	9858.	0.	5325.	0.	338.	5209.	0.	0.	650.	0.	25039.
MAX KW	13.762	0.000	30.899	0.000	36.068	0.000	1.422	20.408	0.000	0.000	2.811	0.000	95.023
DAY/HR	27/17	0/ 0	4/ 9	0/ 0	14/16	0/ 0	1/13	20/16	0/ 0	0/ 0	4/13	0/ 0	14/14
PEAK ENDUSE	10.668	0.000	27.108	0.000	32.984	0.000	1.422	20.033	0.000	0.000	2.807	0.000	
PEAK PCT	11.2	0.0	28.5	0.0	34.7	0.0	1.5	21.1	0.0	0.0	3.0	0.0	
OCT													
KWH	4071.	0.	10639.	0.	723.	0.	323.	4103.	0.	0.	708.	0.	20567.
MAX KW	14.380	0.000	30.899	0.000	18.711	0.000	0.901	12.839	0.000	0.000	2.811	0.000	69.590
DAY/HR	23/18	0/ 0	1/ 9	0/ 0	3/12	0/ 0	13/ 7	18/17	0/ 0	0/ 0	5/13	0/ 0	3/12
PEAK ENDUSE	10.606	0.000	26.147	0.000	18.711	0.000	0.422	11.327	0.000	0.000	2.377	0.000	
PEAK PCT	15.2	0.0	37.6	0.0	26.9	0.0	0.6	16.3	0.0	0.0	3.4	0.0	
NOV													
KWH	4142.	0.	10058.	0.	74.	0.	375.	3867.	0.	0.	659.	0.	19176.
MAX KW	17.935	0.000	30.899	0.000	12.314	0.000	0.991	15.176	0.000	0.000	2.811	0.000	61.845
DAY/HR	23/17	0/ 0	1/ 9	0/ 0	9/14	0/ 0	5/ 8	20/ 7	0/ 0	0/ 0	1/13	0/ 0	9/14
PEAK ENDUSE	10.730	0.000	27.108	0.000	12.314	0.000	0.422	8.459	0.000	0.000	2.811	0.000	
PEAK PCT	17.4	0.0	43.8	0.0	19.9	0.0	0.7	13.7	0.0	0.0	4.5	0.0	
DEC													
KWH	4326.	0.	10276.	0.	15.	0.	427.	4320.	0.	0.	663.	0.	20026.
MAX KW	17.935	0.000	30.899	0.000	5.081	0.000	1.044	19.079	0.000	0.000	2.811	0.000	56.156
DAY/HR	10/17	0/ 0	3/ 9	0/ 0	1/ 9	0/ 0	7/ 7	24/ 7	0/ 0	0/ 0	17/13	0/ 0	24/17
PEAK ENDUSE	17.828	0.000	26.801	0.000	0.002	0.000	0.785	8.588	0.000	0.000	2.151	0.000	
PEAK PCT	31.7	0.0	47.7	0.0	0.0	0.0	1.4	15.3	0.0	0.0	3.8	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
KWH	47033.	0.	123830.	0.	35335.	0.	4728.	58978.	0.	0.	8127.	0.	278031.
MAX KW	17.935	0.000	30.899	0.000	42.261	0.000	1.422	22.973	0.000	0.000	2.811	0.000	105.685
MON/DY	1/ 4	0/ 0	1/ 2	0/ 0	7/20	0/ 0	4/18	7/20	0/ 0	0/ 0	12/17	0/ 0	7/20
PEAK ENDUSE	10.870	0.000	26.724	0.000	42.246	0.000	1.422	22.200	0.000	0.000	2.223	0.000	
PEAK PCT	10.3	0.0	25.3	0.0	40.0	0.0	1.3	21.0	0.0	0.0	2.1	0.0	

YEARLY TRANSFORMER LOSSES = 0.0 KWH

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
THERM	0.	0.	0.	1190.	0.	0.	0.	0.	0.	0.	0.	0.	1190.
MAX THERM/HR	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2
DAY/HR	0/ 0	0/ 0	0/ 0	31/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	31/ 7
PEAK ENDUSE	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
FEB													
THERM	0.	0.	0.	975.	0.	0.	0.	0.	0.	0.	0.	0.	975.
MAX THERM/HR	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2
DAY/HR	0/ 0	0/ 0	0/ 0	17/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	17/ 7
PEAK ENDUSE	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAR													
THERM	0.	0.	0.	796.	0.	0.	0.	0.	0.	0.	0.	0.	796.
MAX THERM/HR	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1
DAY/HR	0/ 0	0/ 0	0/ 0	18/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	18/ 7
PEAK ENDUSE	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
APR													
THERM	0.	0.	0.	389.	0.	0.	0.	0.	0.	0.	0.	0.	389.
MAX THERM/HR	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7
DAY/HR	0/ 0	0/ 0	0/ 0	2/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	2/ 7
PEAK ENDUSE	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAY													
THERM	0.	0.	0.	57.	0.	0.	0.	0.	0.	0.	0.	0.	57.
MAX THERM/HR	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6
DAY/HR	0/ 0	0/ 0	0/ 0	1/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 7
PEAK ENDUSE	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUN													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUL													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AUG													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

SEP													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
OCT													
THERM	0.	0.	0.	101.	0.	0.	0.	0.	0.	0.	0.	0.	101.
MAX THERM/HR	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6
DAY/HR	0/ 0	0/ 0	0/ 0	14/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	14/ 7
PEAK ENDUSE	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NOV													
THERM	0.	0.	0.	606.	0.	0.	0.	0.	0.	0.	0.	0.	606.
MAX THERM/HR	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1
DAY/HR	0/ 0	0/ 0	0/ 0	20/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	20/ 7
PEAK ENDUSE	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
DEC													
THERM	0.	0.	0.	994.	0.	0.	0.	0.	0.	0.	0.	0.	994.
MAX THERM/HR	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3
DAY/HR	0/ 0	0/ 0	0/ 0	25/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	25/ 7
PEAK ENDUSE	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
THERM	0.	0.	0.	5108.	0.	0.	0.	0.	0.	0.	0.	0.	5108.
MAX THERM/HR	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3
MON/DY	0/ 0	0/ 0	0/ 0	12/25	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	12/25
PEAK ENDUSE	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	994.7	0.0	1418.5	220.6	1146.6	9.9	202.5	810.3	0.0	0.0	0.0	0.0	4803.0
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	35.9	0.0	0.0	0.0	0.0	0.0	0.0	6118.3	0.0	6154.2
Hote NATURAL-GAS													
MBTU	0.0	0.0	0.0	1431.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1431.1
MBTU	994.7	0.0	1418.5	1687.6	1146.6	9.9	202.5	810.3	0.0	0.0	6118.3	0.0	12388.4

TOTAL SITE ENERGY 12388.37 MBTU 111.3 KBTU/SQFT-YR GROSS-AREA 111.3 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 21994.42 MBTU 197.7 KBTU/SQFT-YR GROSS-AREA 197.7 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.55
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 48

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

US2 - D1.1 UPDATED U-FACTOR DOE-2.2-47h2 4/15/2019 9:50:59 BDL RUN 1
PROPOSED - FINAL
REPORT- BEPU Building Utility Performance WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY KWH	291447.	0.	415617.	64625.	335948.	2904.	59333.	237411.	0.	0.	0.	0.	1407285.
FM1 NATURAL-GAS THERM	0.	0.	0.	359.	0.	0.	0.	0.	0.	0.	61183.	0.	61542.
Hote NATURAL-GAS THERM	0.	0.	0.	14311.	0.	0.	0.	0.	0.	0.	0.	0.	14311.

TOTAL ELECTRICITY 1407285. KWH 12.649 KWH /SQFT-YR GROSS-AREA 12.649 KWH /SQFT-YR NET-AREA
TOTAL NATURAL-GAS 75853. THERM 0.682 THERM /SQFT-YR GROSS-AREA 0.682 THERM /SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.55
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 48

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

US2 - D1.1 UPDATED U-FACTOR DOE-2.2-47h2 4/15/2019 9:50:59 BDL RUN 1
PROPOSED - FINAL
REPORT- PS-F Energy End-Use Summary for EM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
KWH	24690.	0.	35303.	15745.	12404.	0.	4614.	19895.	0.	0.	0.	0.	112651.
MAX KW	79.079	0.000	108.785	42.206	45.289	0.000	7.728	35.921	0.000	0.000	0.000	0.000	243.552
DAY/HR	2/21	0/ 0	1/ 9	6/ 7	1/12	0/ 0	1/14	30/14	0/ 0	0/ 0	0/ 0	0/ 0	31/21
PEAK ENDUSE	79.079	0.000	82.193	30.992	16.941	0.000	5.865	28.481	0.000	0.000	0.000	0.000	
PEAK PCT	32.5	0.0	33.7	12.7	7.0	0.0	2.4	11.7	0.0	0.0	0.0	0.0	
FEB													
KWH	22307.	0.	31886.	11905.	12612.	0.	4254.	17547.	0.	0.	0.	0.	100510.
MAX KW	79.079	0.000	108.785	42.268	49.990	0.000	7.770	35.346	0.000	0.000	0.000	0.000	238.103
DAY/HR	1/21	0/ 0	3/ 9	17/ 7	28/14	0/ 0	28/14	2/14	0/ 0	0/ 0	0/ 0	0/ 0	1/ 8
PEAK ENDUSE	43.943	0.000	108.444	34.076	14.439	0.000	6.040	31.160	0.000	0.000	0.000	0.000	
PEAK PCT	18.5	0.0	45.5	14.3	6.1	0.0	2.5	13.1	0.0	0.0	0.0	0.0	
MAR													
KWH	24888.	0.	35290.	9427.	17170.	2.	4851.	18950.	0.	0.	0.	0.	110579.
MAX KW	79.079	0.000	108.785	38.684	73.514	0.517	8.988	38.804	0.000	0.000	0.000	0.000	248.494
DAY/HR	1/21	0/ 0	3/ 9	11/ 7	27/17	27/17	27/17	27/17	0/ 0	0/ 0	0/ 0	0/ 0	27/21
PEAK ENDUSE	79.079	0.000	82.193	0.000	54.390	0.000	7.436	25.396	0.000	0.000	0.000	0.000	
PEAK PCT	31.8	0.0	33.1	0.0	21.9	0.0	3.0	10.2	0.0	0.0	0.0	0.0	
APR													
KWH	24024.	0.	34156.	3607.	20558.	19.	4746.	17487.	0.	0.	0.	0.	104596.
MAX KW	79.079	0.000	108.785	24.224	89.585	1.507	9.580	41.717	0.000	0.000	0.000	0.000	263.744
DAY/HR	2/21	0/ 0	1/ 9	5/ 6	18/13	18/13	18/13	27/17	0/ 0	0/ 0	0/ 0	0/ 0	18/21
PEAK ENDUSE	79.079	0.000	82.193	0.000	67.026	0.493	6.658	28.296	0.000	0.000	0.000	0.000	
PEAK PCT	30.0	0.0	31.2	0.0	25.4	0.2	2.5	10.7	0.0	0.0	0.0	0.0	
MAY													
KWH	24888.	0.	35290.	529.	34463.	244.	5230.	20007.	0.	0.	0.	0.	120652.
MAX KW	79.079	0.000	108.785	17.242	109.388	3.290	11.359	45.585	0.000	0.000	0.000	0.000	291.343
DAY/HR	1/21	0/ 0	5/ 9	1/ 6	29/18	29/18	29/18	29/17	0/ 0	0/ 0	0/ 0	0/ 0	29/21
PEAK ENDUSE	79.079	0.000	82.193	0.000	86.560	2.281	7.634	33.597	0.000	0.000	0.000	0.000	
PEAK PCT	27.1	0.0	28.2	0.0	29.7	0.8	2.6	11.5	0.0	0.0	0.0	0.0	
JUN													
KWH	24032.	0.	34155.	12.	43621.	561.	5305.	21325.	0.	0.	0.	0.	129011.
MAX KW	79.079	0.000	108.785	0.682	119.375	3.547	11.850	47.313	0.000	0.000	0.000	0.000	307.185
DAY/HR	1/21	0/ 0	2/ 9	28/ 5	11/18	3/16	11/18	11/16	0/ 0	0/ 0	0/ 0	0/ 0	11/21
PEAK ENDUSE	79.079	0.000	82.193	0.000	97.857	2.547	10.151	35.357	0.000	0.000	0.000	0.000	
PEAK PCT	25.7	0.0	26.8	0.0	31.9	0.8	3.3	11.5	0.0	0.0	0.0	0.0	
JUL													
KWH	24686.	0.	35303.	0.	51759.	894.	5477.	23390.	0.	0.	0.	0.	141509.
MAX KW	79.079	0.000	108.785	0.000	123.306	3.577	12.102	49.162	0.000	0.000	0.000	0.000	310.914
DAY/HR	2/21	0/ 0	1/ 9	0/ 0	20/17	6/18	20/17	20/17	0/ 0	0/ 0	0/ 0	0/ 0	6/21
PEAK ENDUSE	79.079	0.000	82.193	0.000	100.502	2.735	10.413	35.992	0.000	0.000	0.000	0.000	
PEAK PCT	25.4	0.0	26.4	0.0	32.3	0.9	3.3	11.6	0.0	0.0	0.0	0.0	
AUG													
KWH	25091.	0.	35277.	3.	49183.	742.	5435.	22982.	0.	0.	0.	0.	138712.
MAX KW	79.079	0.000	108.785	0.412	118.587	3.327	11.913	48.435	0.000	0.000	0.000	0.000	300.361
DAY/HR	1/21	0/ 0	4/ 9	16/ 6	22/17	22/17	22/18	22/17	0/ 0	0/ 0	0/ 0	0/ 0	13/21
PEAK ENDUSE	79.079	0.000	82.193	0.000	93.271	2.225	9.720	33.872	0.000	0.000	0.000	0.000	
PEAK PCT	26.3	0.0	27.4	0.0	31.1	0.7	3.2	11.3	0.0	0.0	0.0	0.0	

SEP													
KWH	23627.	0.	34182.	64.	39175.	372.	5095.	20320.	0.	0.	0.	0.	122834.
MAX KW	79.079	0.000	108.785	6.314	122.217	3.293	12.146	49.706	0.000	0.000	0.000	0.000	285.970
DAY/HR	4/21	0/ 0	1/ 9	25/ 6	14/16	14/16	14/16	14/16	0/ 0	0/ 0	0/ 0	0/ 0	14/21
PEAK ENDUSE	79.079	0.000	82.193	0.000	83.107	1.830	7.324	32.437	0.000	0.000	0.000	0.000	
PEAK PCT	27.7	0.0	28.7	0.0	29.1	0.6	2.6	11.3	0.0	0.0	0.0	0.0	
OCT													
KWH	24888.	0.	35290.	1510.	26993.	70.	5072.	18833.	0.	0.	0.	0.	112656.
MAX KW	79.079	0.000	108.785	19.931	91.978	1.732	9.566	41.790	0.000	0.000	0.000	0.000	261.665
DAY/HR	1/21	0/ 0	6/ 9	13/ 7	6/15	6/15	8/14	18/16	0/ 0	0/ 0	0/ 0	0/ 0	2/21
PEAK ENDUSE	79.079	0.000	82.193	0.000	64.446	0.500	7.959	27.487	0.000	0.000	0.000	0.000	
PEAK PCT	30.2	0.0	31.4	0.0	24.6	0.2	3.0	10.5	0.0	0.0	0.0	0.0	
NOV													
KWH	23834.	0.	34169.	8269.	14881.	1.	4598.	17490.	0.	0.	0.	0.	103242.
MAX KW	79.079	0.000	108.785	35.352	63.377	0.727	8.311	36.392	0.000	0.000	0.000	0.000	241.217
DAY/HR	1/21	0/ 0	3/ 9	14/ 6	1/15	9/14	1/15	1/15	0/ 0	0/ 0	0/ 0	0/ 0	1/21
PEAK ENDUSE	79.079	0.000	82.193	0.000	48.769	0.000	7.167	24.008	0.000	0.000	0.000	0.000	
PEAK PCT	32.8	0.0	34.1	0.0	20.2	0.0	3.0	10.0	0.0	0.0	0.0	0.0	
DEC													
KWH	24492.	0.	35316.	13554.	13130.	0.	4657.	19183.	0.	0.	0.	0.	110333.
MAX KW	79.079	0.000	108.785	45.377	51.660	0.000	7.910	37.172	0.000	0.000	0.000	0.000	246.109
DAY/HR	3/21	0/ 0	1/ 9	25/ 7	11/13	0/ 0	11/13	24/14	0/ 0	0/ 0	0/ 0	0/ 0	19/21
PEAK ENDUSE	79.079	0.000	82.193	32.099	17.847	0.000	5.929	28.962	0.000	0.000	0.000	0.000	
PEAK PCT	32.1	0.0	33.4	13.0	7.3	0.0	2.4	11.8	0.0	0.0	0.0	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
KWH	291447.	0.	415617.	64625.	335948.	2904.	59333.	237411.	0.	0.	0.	0.	1407285.
MAX KW	79.079	0.000	108.785	45.377	123.306	3.577	12.146	49.706	0.000	0.000	0.000	0.000	310.914
MON/DY	1/ 2	0/ 0	1/ 1	12/25	7/20	7/ 6	9/14	9/14	0/ 0	0/ 0	0/ 0	0/ 0	7/ 6
PEAK ENDUSE	79.079	0.000	82.193	0.000	100.502	2.735	10.413	35.992	0.000	0.000	0.000	0.000	
PEAK PCT	25.4	0.0	26.4	0.0	32.3	0.9	3.3	11.6	0.0	0.0	0.0	0.0	

YEARLY TRANSFORMER LOSSES = 0.0 KWH

REPORT- PS-F Energy End-Use Summary for FM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
THERM	0.	0.	0.	124.	0.	0.	0.	0.	0.	0.	5195.	0.	5319.
MAX THERM/HR	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	17.0
DAY/HR	0/ 0	0/ 0	0/ 0	6/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	28/ 9	0/ 0	31/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	96.1	0.0	
FEB													
THERM	0.	0.	0.	85.	0.	0.	0.	0.	0.	0.	4693.	0.	4778.
MAX THERM/HR	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	16.9
DAY/HR	0/ 0	0/ 0	0/ 0	17/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	25/ 9	0/ 0	1/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	97.1	0.0	
MAR													
THERM	0.	0.	0.	21.	0.	0.	0.	0.	0.	0.	5200.	0.	5221.
MAX THERM/HR	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	16.4
DAY/HR	0/ 0	0/ 0	0/ 0	11/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	25/ 9	0/ 0	25/ 9
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
APR													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	5031.	0.	5031.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	16.4
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 9	0/ 0	1/ 9
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
MAY													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	5199.	0.	5199.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	16.4
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 9	0/ 0	5/ 9
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
JUN													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	5030.	0.	5030.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	16.4
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	2/ 9	0/ 0	2/ 9
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
JUL													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	5195.	0.	5195.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	16.4
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 9	0/ 0	1/ 9
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
AUG													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	5203.	0.	5203.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	16.4
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	4/ 9	0/ 0	4/ 9
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	

SEP													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	5022.	0.	5022.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	16.4
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 9	0/ 0	1/ 9
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
OCT													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	5199.	0.	5199.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	16.4
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	28/ 9	0/ 0	28/ 9
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
NOV													
THERM	0.	0.	0.	11.	0.	0.	0.	0.	0.	0.	5026.	0.	5037.
MAX THERM/HR	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	16.4
DAY/HR	0/ 0	0/ 0	0/ 0	20/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	25/ 9	0/ 0	25/ 9
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
DEC													
THERM	0.	0.	0.	118.	0.	0.	0.	0.	0.	0.	5191.	0.	5309.
MAX THERM/HR	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	17.4
DAY/HR	0/ 0	0/ 0	0/ 0	25/ 6	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	30/ 9	0/ 0	24/ 8
PEAK ENDUSE	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	94.3	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
THERM	0.	0.	0.	359.	0.	0.	0.	0.	0.	0.	61183.	0.	61542.
MAX THERM/HR	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	17.4
MON/DY	0/ 0	0/ 0	0/ 0	12/25	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	3/25	0/ 0	12/24
PEAK ENDUSE	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	
PEAK PCT	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	94.3	0.0	

US2 - D1.1 UPDATED U-FACTOR DOE-2.2-47h2 4/15/2019 9:50:59 BDL RUN 1
PROPOSED - FINAL
REPORT- PS-F Energy End-Use Summary for Hotel Fuel Meter WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
THERM	0.	0.	0.	2564.	0.	0.	0.	0.	0.	0.	0.	0.	2564.
MAX THERM/HR	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0
DAY/HR	0/ 0	0/ 0	0/ 0	31/ 9	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	31/ 9
PEAK ENDUSE	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
FEB													
THERM	0.	0.	0.	2195.	0.	0.	0.	0.	0.	0.	0.	0.	2195.
MAX THERM/HR	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3
DAY/HR	0/ 0	0/ 0	0/ 0	17/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	17/ 7
PEAK ENDUSE	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAR													
THERM	0.	0.	0.	2070.	0.	0.	0.	0.	0.	0.	0.	0.	2070.
MAX THERM/HR	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8
DAY/HR	0/ 0	0/ 0	0/ 0	18/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	18/ 7
PEAK ENDUSE	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
APR													
THERM	0.	0.	0.	1447.	0.	0.	0.	0.	0.	0.	0.	0.	1447.
MAX THERM/HR	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 7
PEAK ENDUSE	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAY													
THERM	0.	0.	0.	634.	0.	0.	0.	0.	0.	0.	0.	0.	634.
MAX THERM/HR	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
DAY/HR	0/ 0	0/ 0	0/ 0	1/ 6	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 6
PEAK ENDUSE	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUN													
THERM	0.	0.	0.	234.	0.	0.	0.	0.	0.	0.	0.	0.	234.
MAX THERM/HR	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
DAY/HR	0/ 0	0/ 0	0/ 0	14/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	14/ 5
PEAK ENDUSE	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUL													
THERM	0.	0.	0.	29.	0.	0.	0.	0.	0.	0.	0.	0.	29.
MAX THERM/HR	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 3	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 3
PEAK ENDUSE	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AUG													
THERM	0.	0.	0.	72.	0.	0.	0.	0.	0.	0.	0.	0.	72.
MAX THERM/HR	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 6	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 6
PEAK ENDUSE	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

SEP													
THERM	0.	0.	0.	269.	0.	0.	0.	0.	0.	0.	0.	0.	269.
MAX THERM/HR	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9
DAY/HR	0/ 0	0/ 0	0/ 0	29/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	29/ 7
PEAK ENDUSE	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
OCT													
THERM	0.	0.	0.	895.	0.	0.	0.	0.	0.	0.	0.	0.	895.
MAX THERM/HR	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7
DAY/HR	0/ 0	0/ 0	0/ 0	27/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	27/ 7
PEAK ENDUSE	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NOV													
THERM	0.	0.	0.	1649.	0.	0.	0.	0.	0.	0.	0.	0.	1649.
MAX THERM/HR	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5
DAY/HR	0/ 0	0/ 0	0/ 0	14/ 6	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	14/ 6
PEAK ENDUSE	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
DEC													
THERM	0.	0.	0.	2254.	0.	0.	0.	0.	0.	0.	0.	0.	2254.
MAX THERM/HR	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9
DAY/HR	0/ 0	0/ 0	0/ 0	24/ 9	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	24/ 9
PEAK ENDUSE	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
THERM	0.	0.	0.	14311.	0.	0.	0.	0.	0.	0.	0.	0.	14311.
MAX THERM/HR	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9
MON/DY	0/ 0	0/ 0	0/ 0	12/24	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	12/24
PEAK ENDUSE	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	3918.2	0.0	12031.8	529.0	4077.3	42.5	1125.9	3402.9	0.0	0.1	0.0	0.0	25127.7
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	960.7	0.0	0.0	0.0	0.0	0.0	0.0	3915.4	0.0	4876.2
MBTU	3918.2	0.0	12031.8	1489.8	4077.3	42.5	1125.9	3402.9	0.0	0.1	3915.4	0.0	30003.9

TOTAL SITE ENERGY 30003.86 MBTU 76.0 KBTU/SQFT-YR GROSS-AREA 76.0 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 80259.35 MBTU 203.3 KBTU/SQFT-YR GROSS-AREA 203.3 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.68
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 99
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 48

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

US2 - D2.2/D2.3 WWR at 40% UPDATE DOE-2.2-47h2 4/15/2019 9:17:43 BDL RUN 1
PROPOSED - FINAL
REPORT- BEPU Building Utility Performance WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY KWH	1148025.	0.	3525308.	155003.	1194652.	12465.	329897.	997048.	0.	17.	0.	0.	7362417.
FM1 NATURAL-GAS THERM	0.	0.	0.	9607.	0.	0.	0.	0.	0.	0.	39154.	0.	48762.

TOTAL ELECTRICITY 7362417. KWH 18.653 KWH /SQFT-YR GROSS-AREA 18.653 KWH /SQFT-YR NET-AREA
TOTAL NATURAL-GAS 48762. THERM 0.124 THERM /SQFT-YR GROSS-AREA 0.124 THERM /SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.68
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 99
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 48

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

US2 - D2.2/D2.3 WWR at 40% UPDATE DOE-2.2-47h2 4/15/2019 9:17:43 BDL RUN 1
PROPOSED - FINAL
REPORT- PS-F Energy End-Use Summary for EM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
KWH	97709.	0.	299370.	38938.	45605.	0.	28637.	79996.	0.	1.	0.	0.	590256.
MAX KW	337.947	0.000	644.513	121.768	126.644	0.000	43.675	128.923	0.000	0.108	0.000	0.000	1236.769
DAY/HR	2/20	0/ 0	1/18	6/ 7	1/13	0/ 0	30/ 8	31/ 8	0/ 0	11/10	0/ 0	0/ 0	31/19
PEAK ENDUSE	291.322	0.000	631.269	66.660	78.499	0.000	42.836	126.183	0.000	0.000	0.000	0.000	
PEAK PCT	23.6	0.0	51.0	5.4	6.3	0.0	3.5	10.2	0.0	0.0	0.0	0.0	
FEB													
KWH	88153.	0.	270403.	29602.	44394.	0.	26176.	71029.	0.	2.	0.	0.	529760.
MAX KW	337.947	0.000	644.513	126.899	137.592	0.000	43.503	128.188	0.000	0.214	0.000	0.000	1223.959
DAY/HR	1/20	0/ 0	1/18	2/ 7	28/17	0/ 0	17/ 6	1/ 8	0/ 0	12/ 6	0/ 0	0/ 0	14/19
PEAK ENDUSE	291.322	0.000	631.269	13.052	130.150	0.000	39.031	119.136	0.000	0.000	0.000	0.000	
PEAK PCT	23.8	0.0	51.6	1.1	10.6	0.0	3.2	9.7	0.0	0.0	0.0	0.0	
MAR													
KWH	97527.	0.	299494.	22247.	59596.	28.	28822.	77529.	0.	2.	0.	0.	585246.
MAX KW	337.947	0.000	644.513	107.898	257.750	2.512	43.633	152.846	0.000	0.127	0.000	0.000	1336.687
DAY/HR	1/20	0/ 0	1/18	18/ 7	27/18	27/18	17/24	27/18	0/ 0	30/ 6	0/ 0	0/ 0	27/19
PEAK ENDUSE	289.420	0.000	631.269	0.000	233.457	1.943	34.949	145.648	0.000	0.000	0.000	0.000	
PEAK PCT	21.7	0.0	47.2	0.0	17.5	0.1	2.6	10.9	0.0	0.0	0.0	0.0	
APR													
KWH	94283.	0.	289801.	9265.	75439.	177.	27316.	75344.	0.	3.	0.	0.	571628.
MAX KW	337.947	0.000	644.513	53.781	311.971	5.307	41.862	164.838	0.000	0.159	0.000	0.000	1417.674
DAY/HR	3/20	0/ 0	1/18	5/ 6	27/18	18/18	18/12	27/18	0/ 0	7/ 6	0/ 0	0/ 0	18/19
PEAK ENDUSE	289.376	0.000	631.269	0.000	294.769	5.082	41.362	155.816	0.000	0.000	0.000	0.000	
PEAK PCT	20.4	0.0	44.5	0.0	20.8	0.4	2.9	11.0	0.0	0.0	0.0	0.0	
MAY													
KWH	97365.	0.	299494.	2396.	123551.	1181.	26802.	86937.	0.	0.	0.	0.	637727.
MAX KW	337.793	0.000	644.513	18.511	408.660	12.358	41.862	180.095	0.000	0.107	0.000	0.000	1550.204
DAY/HR	4/20	0/ 0	1/18	1/ 6	29/18	29/18	12/17	29/18	0/ 0	2/ 6	0/ 0	0/ 0	29/19
PEAK ENDUSE	289.052	0.000	631.269	0.000	397.244	10.949	41.862	179.827	0.000	0.000	0.000	0.000	
PEAK PCT	18.6	0.0	40.7	0.0	25.6	0.7	2.7	11.6	0.0	0.0	0.0	0.0	
JUN													
KWH	94172.	0.	289793.	178.	152087.	2260.	26520.	90750.	0.	0.	0.	0.	655760.
MAX KW	337.419	0.000	644.513	7.802	437.207	12.676	41.862	187.806	0.000	0.000	0.000	0.000	1589.909
DAY/HR	21/20	0/ 0	1/18	7/ 3	11/18	3/16	1/ 9	11/18	0/ 0	0/ 0	0/ 0	0/ 0	11/19
PEAK ENDUSE	288.937	0.000	631.269	0.000	428.956	11.557	41.862	187.327	0.000	0.000	0.000	0.000	
PEAK PCT	18.2	0.0	39.7	0.0	27.0	0.7	2.6	11.8	0.0	0.0	0.0	0.0	
JUL													
KWH	97308.	0.	299374.	0.	180217.	3545.	28766.	98124.	0.	0.	0.	0.	707334.
MAX KW	337.337	0.000	644.513	0.000	443.217	13.020	41.862	188.365	0.000	0.000	0.000	0.000	1597.607
DAY/HR	27/20	0/ 0	1/18	0/ 0	20/18	6/18	2/21	20/18	0/ 0	0/ 0	0/ 0	0/ 0	6/19
PEAK ENDUSE	288.996	0.000	631.269	0.000	435.647	12.851	41.862	186.982	0.000	0.000	0.000	0.000	
PEAK PCT	18.1	0.0	39.5	0.0	27.3	0.8	2.6	11.7	0.0	0.0	0.0	0.0	
AUG													
KWH	97394.	0.	299614.	13.	170603.	3002.	28276.	96086.	0.	0.	0.	0.	694988.
MAX KW	337.890	0.000	644.513	6.309	423.818	12.833	41.862	185.251	0.000	0.000	0.000	0.000	1561.465
DAY/HR	27/20	0/ 0	1/18	5/ 6	22/18	25/20	1/14	22/18	0/ 0	0/ 0	0/ 0	0/ 0	22/19
PEAK ENDUSE	289.156	0.000	631.269	0.000	406.121	10.660	41.862	182.396	0.000	0.000	0.000	0.000	
PEAK PCT	18.5	0.0	40.4	0.0	26.0	0.7	2.7	11.7	0.0	0.0	0.0	0.0	

SEP													
KWH	94266.	0.	289554.	415.	136630.	1692.	25911.	87460.	0.	0.	0.	0.	635927.
MAX KW	337.947	0.000	644.513	11.106	403.203	11.084	41.862	178.281	0.000	0.000	0.000	0.000	1510.925
DAY/HR	7/20	0/ 0	1/18	29/ 7	14/18	14/18	1/12	14/18	0/ 0	0/ 0	0/ 0	0/ 0	14/18
PEAK ENDUSE	231.982	0.000	644.513	0.000	403.203	11.084	41.862	178.281	0.000	0.000	0.000	0.000	
PEAK PCT	15.4	0.0	42.7	0.0	26.7	0.7	2.8	11.8	0.0	0.0	0.0	0.0	
OCT													
KWH	97556.	0.	299494.	4150.	98913.	537.	26637.	81833.	0.	0.	0.	0.	609121.
MAX KW	337.947	0.000	644.513	24.486	287.849	5.340	41.287	157.047	0.000	0.114	0.000	0.000	1364.353
DAY/HR	1/20	0/ 0	1/18	13/ 7	6/16	3/12	3/12	6/18	0/ 0	30/ 5	0/ 0	0/ 0	2/19
PEAK ENDUSE	291.063	0.000	631.269	0.000	254.101	3.380	34.949	149.591	0.000	0.000	0.000	0.000	
PEAK PCT	21.3	0.0	46.3	0.0	18.6	0.2	2.6	11.0	0.0	0.0	0.0	0.0	
NOV													
KWH	94553.	0.	289669.	16383.	57708.	33.	27380.	73431.	0.	4.	0.	0.	559162.
MAX KW	337.947	0.000	644.513	102.918	214.929	3.916	42.487	132.832	0.000	0.211	0.000	0.000	1293.652
DAY/HR	1/20	0/ 0	1/18	20/ 7	9/14	9/14	13/24	1/19	0/ 0	16/ 6	0/ 0	0/ 0	1/19
PEAK ENDUSE	291.322	0.000	631.269	0.061	201.761	1.459	34.949	132.832	0.000	0.000	0.000	0.000	
PEAK PCT	22.5	0.0	48.8	0.0	15.6	0.1	2.7	10.3	0.0	0.0	0.0	0.0	
DEC													
KWH	97739.	0.	299247.	31416.	49909.	11.	28654.	78529.	0.	4.	0.	0.	585509.
MAX KW	337.947	0.000	644.513	143.076	173.588	1.170	47.976	134.304	0.000	0.229	0.000	0.000	1249.198
DAY/HR	3/20	0/ 0	1/18	24/ 7	15/19	15/13	24/ 6	24/ 8	0/ 0	9/ 4	0/ 0	0/ 0	15/19
PEAK ENDUSE	289.512	0.000	623.290	0.069	173.588	0.917	34.157	127.664	0.000	0.000	0.000	0.000	
PEAK PCT	23.2	0.0	49.9	0.0	13.9	0.1	2.7	10.2	0.0	0.0	0.0	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
KWH	1148025.	0.	3525308.	155003.	1194652.	12465.	329897.	997048.	0.	17.	0.	0.	7362417.
MAX KW	337.947	0.000	644.513	143.076	443.217	13.020	47.976	188.365	0.000	0.229	0.000	0.000	1597.607
MON/DY	1/ 2	0/ 0	1/ 1	12/24	7/20	7/ 6	12/24	7/20	0/ 0	12/ 9	0/ 0	0/ 0	7/ 6
PEAK ENDUSE	288.996	0.000	631.269	0.000	435.647	12.851	41.862	186.982	0.000	0.000	0.000	0.000	
PEAK PCT	18.1	0.0	39.5	0.0	27.3	0.8	2.6	11.7	0.0	0.0	0.0	0.0	

YEARLY TRANSFORMER LOSSES = 0.0 KWH

REPORT- PS-F Energy End-Use Summary for FM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
THERM	0.	0.	0.	2476.	0.	0.	0.	0.	0.	0.	3330.	0.	5806.
MAX THERM/HR	0.0	0.0	0.0	12.1	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	18.8
DAY/HR	0/ 0	0/ 0	0/ 0	6/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	30/ 8	0/ 0	6/ 7
PEAK ENDUSE	0.0	0.0	0.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	0.0	
PEAK PCT	0.0	0.0	0.0	58.3	0.0	0.0	0.0	0.0	0.0	0.0	41.7	0.0	
FEB													
THERM	0.	0.	0.	1947.	0.	0.	0.	0.	0.	0.	3007.	0.	4955.
MAX THERM/HR	0.0	0.0	0.0	13.2	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	19.4
DAY/HR	0/ 0	0/ 0	0/ 0	1/ 4	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 8	0/ 0	2/ 7
PEAK ENDUSE	0.0	0.0	0.0	11.6	0.0	0.0	0.0	0.0	0.0	0.0	7.9	0.0	
PEAK PCT	0.0	0.0	0.0	59.6	0.0	0.0	0.0	0.0	0.0	0.0	40.4	0.0	
MAR													
THERM	0.	0.	0.	1364.	0.	0.	0.	0.	0.	0.	3329.	0.	4693.
MAX THERM/HR	0.0	0.0	0.0	9.3	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	16.2
DAY/HR	0/ 0	0/ 0	0/ 0	18/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	20/ 8	0/ 0	18/ 7
PEAK ENDUSE	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0	0.0	7.9	0.0	
PEAK PCT	0.0	0.0	0.0	51.4	0.0	0.0	0.0	0.0	0.0	0.0	48.6	0.0	
APR													
THERM	0.	0.	0.	561.	0.	0.	0.	0.	0.	0.	3219.	0.	3781.
MAX THERM/HR	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	11.0
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 6	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 8	0/ 0	5/ 7
PEAK ENDUSE	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	7.9	0.0	
PEAK PCT	0.0	0.0	0.0	28.7	0.0	0.0	0.0	0.0	0.0	0.0	71.3	0.0	
MAY													
THERM	0.	0.	0.	74.	0.	0.	0.	0.	0.	0.	3325.	0.	3398.
MAX THERM/HR	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	9.3
DAY/HR	0/ 0	0/ 0	0/ 0	1/ 6	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	2/ 8	0/ 0	1/ 8
PEAK ENDUSE	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	
PEAK PCT	0.0	0.0	0.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	89.5	0.0	
JUN													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3215.	0.	3215.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	8.3
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 8	0/ 0	1/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
JUL													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3321.	0.	3321.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	8.3
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	2/ 8	0/ 0	2/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
AUG													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3321.	0.	3321.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	8.3
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	18/ 8	0/ 0	18/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	

SEP													
THERM	0.	0.	0.	8.	0.	0.	0.	0.	0.	0.	3215.	0.	3222.
MAX THERM/HR	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	8.8
DAY/HR	0/ 0	0/ 0	0/ 0	29/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	30/ 8	0/ 0	29/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	
PEAK PCT	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	94.7	0.0	
OCT													
THERM	0.	0.	0.	164.	0.	0.	0.	0.	0.	0.	3324.	0.	3489.
MAX THERM/HR	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	9.7
DAY/HR	0/ 0	0/ 0	0/ 0	30/ 6	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	31/ 8	0/ 0	27/ 8
PEAK ENDUSE	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	
PEAK PCT	0.0	0.0	0.0	14.4	0.0	0.0	0.0	0.0	0.0	0.0	85.6	0.0	
NOV													
THERM	0.	0.	0.	955.	0.	0.	0.	0.	0.	0.	3220.	0.	4175.
MAX THERM/HR	0.0	0.0	0.0	9.5	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	15.4
DAY/HR	0/ 0	0/ 0	0/ 0	20/ 4	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	23/ 8	0/ 0	20/ 7
PEAK ENDUSE	0.0	0.0	0.0	7.5	0.0	0.0	0.0	0.0	0.0	0.0	7.9	0.0	
PEAK PCT	0.0	0.0	0.0	48.9	0.0	0.0	0.0	0.0	0.0	0.0	51.1	0.0	
DEC													
THERM	0.	0.	0.	2058.	0.	0.	0.	0.	0.	0.	3329.	0.	5386.
MAX THERM/HR	0.0	0.0	0.0	16.3	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	23.4
DAY/HR	0/ 0	0/ 0	0/ 0	25/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	26/ 8	0/ 0	24/ 7
PEAK ENDUSE	0.0	0.0	0.0	15.6	0.0	0.0	0.0	0.0	0.0	0.0	7.9	0.0	
PEAK PCT	0.0	0.0	0.0	66.5	0.0	0.0	0.0	0.0	0.0	0.0	33.5	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
THERM	0.	0.	0.	9607.	0.	0.	0.	0.	0.	0.	39154.	0.	48762.
MAX THERM/HR	0.0	0.0	0.0	16.3	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	23.4
MON/DY	0/ 0	0/ 0	0/ 0	12/25	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/30	0/ 0	12/24
PEAK ENDUSE	0.0	0.0	0.0	15.6	0.0	0.0	0.0	0.0	0.0	0.0	7.9	0.0	
PEAK PCT	0.0	0.0	0.0	66.5	0.0	0.0	0.0	0.0	0.0	0.0	33.5	0.0	

E.3 Passive House Study

Stantec

Stantec Architecture & Engineering
311 Summer Street – Boston, MA 02210

April 22, 2019
File: 229101084

Attention: Greg Karczewski
Union Square RELP Master Developer LLC
31 Union Square
Somerville, MA 02143

Dear Mr. Karczewski,

Reference: Union Square – FEIR Passive House Study

INTRODUCTION

As requested, the following Passive House Study for residential projects within the USQ development was prepared as requested by the DOER as part of the MEPA process. This study was led by Blake Jackson, a Certified Passive House Consultant, and included the input of project MEP, construction, development and sustainability consultants.

Passive House is a standard, adapted from Germany, that serves as a pathway for ultra-efficient, low-energy buildings ~65-80% below standard construction (MA Stretch Energy Code Baseline – ASHRAE 90.1-2013 with IECC 2015 Amendments). The standard is predicated upon these main pillars:

- Super insulation, well exceeding code minimum requirements
- Passive House windows, typically operable (tilt/turn) triple-glazing, argon filled, with low-E coatings
- Load balancing predicated on heat or energy recovery ventilation (HRV/ERV) – climate dependent
- Airtight envelope with minimal thermal bridging through rigorous detailing
- Design team, CM and trades training to ensure top quality/blower door test passing (ASTM E-779)

As part of MEPA review, the team has been asked to consider Passive House pilot projects within USQ for all residential buildings beyond Phase-1, including buildings D3.2 (high-rise), D4.3, D5.3, D7.1 and D7.2 (all mid-rise). For the purposes of this study, all planned ground-floor retail was excluded from the analysis.

Reference: **Union Square – FEIR Passive House Study**

STUDY PARAMETERS

The team has established the following general guidelines (Table-1) for the feasibility studies, applicable to all parcels, based on PHIUS+ 2018 and after an extensive review of built examples within ASHRAE Climate Zone 5.

Table-1: Baseline Modeling Assumptions

R-65 Foundation	Applies to portions touching/anchoring levels 2-4 to grade (lobby, stairs, etc.)
R-65 Floor	Applies to floor below level 2 only
R-60 Opaque Walls	This also includes any spandrel panels within the design
U-0.15/SHGC-0.50 Glazing	Based on North American available Passive House tilt/turn, operable products currently on the market within acceptable ranges per ASHRAE Zone 5a
R-60 Roof	Assumes low-slope, hi-albedo roofing membrane (PV-ready + Solar/Thermal to reduce DHW load – a high portion of overall loads in a Passive House)
Window-to-Wall Ratio	Code maximum allowable (24%)
Residential Source Energy	3,840 kWh/person/year
Airtightness	0.060 CFM50/sf-envelope
Daily DHW Allowance	6.6 gallons/day/person @140-dregreesF
Heating Coil Temperature	125.5-degreesF, maximum
Filtration	MERV 8, minimum; MERV 13, recommended
Additional Required Standards	Ventilation: ASHRAE 62.2-2016 (ERV/HRV), IRC and BSC Standard-1 General: EnergyStar, DOE Zero Energy Ready Home and EPA Indoor Air Plus
Setpoints	68-degreesF (Heating) and 77-degreesF (Cooling)
Target EUI[1]	20 kBTU/sf/year (Baseline EUI for Boston multifamily = 53 (54% Electric/46% Gas, which translates into Electric EUI-29 and Gas EUI-24 for baseline)
Electrification	Whole building – all systems (VRF/no natural gas)
Interior LPD	0.30 watts/sf
Equipment Power Density	0.20 watts/sf – assumes all eligible EnergyStar rated options applied
HVAC System Type	VRF (14.4 EER Cooling and 3.3 COP Heating)

[1] *EUI 53 is based on similar projects currently underway in Boston, MA, and it represents MA Stretch Code Baseline – AHRAE 90.1-2013 with IECC 2015 Amendments (not LEEDv4 Baseline – ASHRAE 90.1-2010). We selected this option because 1) we will have to comply with Stretch Code and 2) because it is the higher-performing option of the two above baselines.*

Reference: **Union Square – FEIR Passive House Study**

ECONOMIC ANALYSIS

In order to determine the feasibility of Passive House for the balance of the Project residential buildings, the team prepared the following economic analysis for each building that considered first cost, ownership cost, and operational costs (and savings) of a Passive House approach to each building. Available incentives were also identified and included.

Estimated Costs

For the purposes of this study, the construction cost premium associated with a Passive House project was estimated at $8.88 gsf based on the NYSERDA Study discussed in Section 7.2.2.3 of the DEIR. This estimated premium includes both the increase in the initial capital cost due to higher-performing envelope systems, construction methods, and testing, and the decrease in the equipment cost due to the significant reduction in heating and cooling loads. Additionally, soft costs associated with financing the cost premium have been included.

Incentives

The Passive House analysis also considers available utility and state incentives programs that would be available to the projects: these include MassSave's Multi-Family Whole Building Incentive and the MA Alternative Energy Credit (AEC) program (Scenario A or B, DOER spreadsheet). This reflects current 2019 utility rates of $0.16/kWh (blended average, use and demand) and $1.20/therm, even though in the Passive House scenario, the buildings would be all-electric.

For MassSave, projects demonstrating greater than 30% savings are awarded $0.50/kWh avoided and $2.10/therm avoided (based on the highest performing Eversource range of $0.20-$0.50/kWh and $1.80-$2.10/therm). For the State's AEC program, the study includes bonus multipliers for Passive House certification. Each program analyses project attributes on a case-by-case basis, with energy conservation evaluated individually as part of overall savings when bundled. These analyses, included in Tables-2 through -6, represent a moment in time, acknowledging that incentives and pricing may change over time. Below are tables for each residential building, with benefits and returns clearly broken out for each:

Reference: Union Square – FEIR Passive House Study

Table-2: Economic Analysis, D3.2 (High-Rise)

Measure	Value (estimated)
Number of Residential Units	376
Residential Square Footage	333,000
Passive House Premium ($8.88/residential sf)	$2,957,040
Operational Savings	
Electricity Use Savings	$134,605
Gas Use Savings	$97,442
Total Savings	**$232,047**
Payback Period Without Incentives	**12.7-years**
Incentives	
Value of Electric Incentive	$420,642
Value of Gas Incentive	$170,489
Value of AEC (Scenario B)	$499,140
Total Incentive Value	**$1,090,271**
Premium Less Total Incentives	**$1,866,769**
Payback Period With Incentives	**8.0-years**
GHG,Baseline	**1,466 tons/yr**
GHG,Passive House Alternative	**693 tons/yr**
GHG Reduction Associated with Passive House	**52.8%**

Table-3: Economic Analysis, D4.3 (Mid-Rise)

Measure	Value (estimated)
Number of Residential Units	48
Residential Square Footage	54,000
Passive House Premium ($8.88/residential sf)	$479,520
Operational Savings	
Electricity Use Savings	$21,828
Gas Use Savings	$15,798
Total Savings	**$37,626**
Payback Period Without Incentives	**12.7-years**
Incentives	
Value of Electric Incentive	$68,212
Value of Gas Incentive	$27,647
Value of AEC (Scenario A)	$108,000

Reference: Union Square – FEIR Passive House Study

Total Incentive Value	**$203,859**
Premium Less Total Incentives	**$275,661**
Payback Period With Incentives	**7.3-years**
GHG,Baseline	**237 tons/yr**
GHG,Passive House Alternative	**112 tons/yr**
GHG Reduction Associated with Passive House	**52.8%**

Table-3: Economic Analysis, D5.3 (Mid-Rise)

Measure	**Value (estimated)**
Number of Residential Units	25
Residential Square Footage	30,000
Passive House Premium ($8.88/residential sf)	$266,400
Operational Savings	
Electricity Use Savings	$12,127
Gas Use Savings	$8,777
Total Savings	**$20,904**
Payback Period Without Incentives	**12.7-years**
Incentives	
Value of Electric Incentive	$37,896
Value of Gas Incentive	$15,359
Value of AEC (Scenario A)	$56,250
Total Incentive Value	**$109,505**
Premium Less Total Incentives	**$156,895**
Payback Period With Incentives	**7.5-years**
GHG,Baseline	**132 tons/yr**
GHG,Passive House Alternative	**62 tons/yr**
GHG Reduction Associated with Passive House	**52.9%**

Table-3: Economic Analysis, D7.1 (Mid-Rise)

Measure	**Value (estimated)**
Number of Residential Units	34
Residential Square Footage	40,000
Passive House Premium ($8.88/residential sf)	$355,200
Operational Savings	
Electricity Use Savings	$16,169

Reference: Union Square – FEIR Passive House Study

Gas Use Savings	$11,702
Total Savings	**$27,871**
Payback Period Without Incentives	**12.7-years**
Incentives	
Value of Electric Incentive	$50,528
Value of Gas Incentive	$20,479
Value of AEC (Scenario A)	$76,500
Total Incentive Value	**$147,507**
Premium Less Total Incentives	**$207,693**
Payback Period With Incentives	**7.5-years**
GHG,Baseline	**176 tons/yr**
GHG,Passive House Alternative	**83 tons/yr**
GHG Reduction Associated with Passive House	**52.8%**

Table-3: Economic Analysis, D7.2 (Mid-Rise)

Measure	**Value (estimated)**
Number of Residential Units	65
Residential Square Footage	77,000
Passive House Premium ($8.88/residential sf)	$683,760
Operational Savings	
Electricity Use Savings	$31,125
Gas Use Savings	$22,527
Total Savings	**$53,652**
Payback Period Without Incentives	**12.7-years**
Incentives	
Value of Electric Incentive	$97,266
Value of Gas Incentive	$39,422
Value of AEC (Scenario A)	$146,250
Total Incentive Value	**$282,938**
Premium Less Total Incentives	**$400,822**
Payback Period With Incentives	**7.5-years**
GHG,Baseline	**339 tons/yr**
GHG,Passive House Alternative	**160 tons/yr**
GHG Reduction Associated with Passive House	**52.7%**

CONCLUSIONS

The Passive House approach generates significant reductions in greenhouse gas emissions at a greater construction cost. A portion of these first costs are offset through available incentives, while the balance is recouped through operational savings over many years of operation. Full capture of all the estimated incentives would result in a payback period of at least seven years and up to more than twelve years based on this analysis.

With performance in large part subject to product type configuration (mid-rise vs. high-rise), the team would necessarily qualify additional observations in a similar fashion:

High-rise Passive House Construction

Based on the analysis herein and as discussed in DEIR Section 7.2.2.3, high-rise Passive House construction presents unique obstacles within the Union Square context that merit consideration relative to feasibility.

- Passive House can achieve meaningful energy use and greenhouse gas reductions
- Passive house can provide other attractive benefits to occupants including: noise reduction, indoor air quality improvements, comfort improvements and higher quality doors and windows.
- While Passive House is becoming more common for the single-family and mid-rise multifamily in select markets, it is even less common for high-rise construction
- Even with incentives, the payback period is significant.
- The Union Square Zoning requires a square floor plate on the High-Rise tower which creates inherent inefficiencies and additional project cost even before Passive House is considered. Accommodating Passive House HVAC systems on upper floors would further create inefficiencies.
- Based on our conversations with market participants, Passive House incurs a 5-10% premium for single and multifamily construction; however, it will likely be even higher for high-rises because of the need for solar control, the inability of the project to seek an ideal solar orientation, the desire to offer all units an equivalent view (rather than smaller windows to the north, east and west), and the ratio

of envelope to enclosed space not aligning with Passive House "norms" for smaller-scaled structures[2].

- There are limited High-Rise Passive House precedents in the U.S. The precedents are largely limited to institutional projects or affordable housing projects that benefit from a longer investment horizon than market-driven projects and/or significant financial subsidies (e.g. minimal land costs, zoning bonuses, other funding sources, etc.). –In contrast, the subject project is a market-rate project that does not equally benefit from zoning bonuses or financial subsidies. Additionally, there is a privately-funded 20% affordable housing requirement for the Project, which further impacts project finances that other case studies have not had to consider, particularly for Passive House level premiums[3].

- Electrification, while good in conjunction with "greening" the grid for long-term state-wide GHG emissions reductions, it is not currently the most efficient (or cost-effective) method for residential unit heating/cooking. Also, the methodology for appliance load modeling in PHIUS+ 2018 factors in natural gas use, not electrification – both options are allowable.

- Lastly, VRF systems, which the team was asked to address in the updated modeling, loses practical viability above 10-12 floors; thus, for high-rise construction, it would require interstitial rooms, which would result in a further loss of units due to the need for out-board mechanical rooms that would result in a negative impact on the aesthetics of the building's architectural expression.

Mid-rise Passive House Construction

Passive House is a step towards greater greenhouse gas reductions beyond the baseline as demonstrated through the included analysis. However, the midrise (like the high-rise) presents obstacles to implementation that should be carefully evaluated prior to project inclusion.

- Passive House can achieve meaningful energy use and greenhouse gas reductions.

- Passive house can provide other attractive benefits to occupants including: noise reduction, indoor air quality improvements, comfort improvements and higher quality doors and windows.

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[2] *Note: one of the main innovations of Passive House is that because of the airtight envelope and energy recovery systems employed, the heat load of the occupants becomes a major factor in the design/energy source for the building.*

[3] *Increased occupant density, relative to the ratio of envelope to enclosed space – indicative of (rental) high-rise construction – is unprecedented at this scale. The Cornel University project has a more predictable occupant load (1 student/unit), based on Passive House methodology where 1bedroom = 1occupant. This may not be the case for a rental-based building because multiple occupants may share single studios or 1-bed units. Additionally, the heat loads of pets – common in multifamily – is not factored into the Passive House methodology.*

- Even with incentives, the payback period is significant.

- The local construction market, building trades, designers and lenders have limited familiarity or experience with projects seeking Passive House certification at any scale and the attendant benefits, costs and risks. Thus, the pool of qualified professionals who can deliver a building to market is limited. This increases the cost of Passive House projects and potentially acts as a barrier to broader market adoption. To wit, US2 spoke with a local affordable housing developer that recently priced out a mid-rise Passive House project and identified an 8% cost premium.

  Demonstration Passive House projects and Passive House incentive programs will be critical to creating market acceptance and lowering costs for Passive House Projects. Based on our interaction with market participants, there appears to be local focus in these areas which is very positive.

- Market demand is not driving Passive House yet; thus, the project may be perceived as financially risky, and given the state of housing cost in MA, renters are not looking to pay a premium for this, despite the many benefits – particularly if costs for high-performance are being passed onto them.

- Passive House is not just a building and construction standard; it is predicated upon operational protocols and a lifestyle choice. If the building is not used properly by the facilities staff/occupants, it could result in the buildings not performing as designed.

- The exclusion of the retail/parking portion of the buildings will create a technical challenge for the projects, and it will cause additional cost to accommodate the thickness of the level-2 celling to maintain an R-65 continuous insulation, which will increase both the structural loading of the building (not yet accommodated for) and the height to maintain clearances for van access.

This Passive House Study was helpful in evaluating the potential of Passive House for the residential portions of the Project. It demonstrates that Passive House methodologies, or a certified building, will improve the Project's energy use and GHG reduction. However, this benefit comes at a significant cost as indicated by payback periods between 7.5 and 12 years even after incentives are captured. As outlined above, other considerations related to both mid-rise and high-rise Passive House project's increase risk. These factors make Passive House feasibility or Passive House commitments difficult for market-driven projects like the subject Project.

Reference: **Union Square – FEIR Passive House Study**

Regards,

Blake Jackson, AIA, LEED/WELL Faculty, Fitwel Ambassador

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E.4 Electrification Study

ELECTRIFICATION STUDY

Union Square

May, 2019

Model Group 3 (Medium Office Building D6.1) Electric Alternatives

Modeled Conditioned space	111,564	sf
Design Conditioned space	111,564	sf
Factor	1.0	

		Baseline	Proposed	Alternative 3 VRF w/ DOAS Gas DHW	Alternative 4 VRF w/ DOAS HP DHW
DIRECT (NATURAL GAS)		MMBtu/yr	MMBtu/yr	MMBtu/yr	MMBtu/yr
Space Heating		1,792	1,300	280	280
Domestic Hot Water		0	129	129	0
Misc. Equipment		0	0	0	0
	subtotal	1,792	1,429	409	280
INDIRECT (ELECTRICITY)		MWh/yr	MWh/yr	MWh/yr	MWh/yr
Space Cooling		180	133	94	94
Space Heating		0	0	10	10
Domestic Hot Water		54	3	3	37
Fans Interior		263	262	132	132
Pumps		12	7	8	7
Heat Rejection		0	0	0	0
Internal Lighting		270	220	220	220
Misc. Equipment		405	405	405	405
	subtotal	1,183	1,030	871	905
ENERGY USE INDEX	PNNL reference[4]	kBtu/sf/yr	kBtu/sf/yr	kBtu/sf/yr	kBtu/sf/yr
	73.3	52.3	44.3	30.3	30.2
	Diff, % (compared to baseline)		**-15%**	**-42%**	**-42%**
GHG EMISSIONS		tons/yr	tons/yr	tons/yr	tons/yr
Direct	Gas-burning	105	84	24	16
Indirect	Electricity	420	366	309	321
	Total	525	449	333	338
	Diff, tpy		**-76**	**-192**	**-187**
	Diff, % (compared to baseline)		**-14.4%**	**-36.5%**	**-35.7%**

CO_2 Emission Factors:

Electricity [2]	710	lb/MWh
Natural Gas [3]	117	lb/MMBtu

[2] 2016 ISO New England Electric Generator Air Emissions Report

[3] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)

[4] Pacific Northwest National Laboratory study, Massachusetts Zone 5A, ASHRAE 90.1-2013, Large Office

Model Group 3 (Medium Office Building D6.1) Electric Alternatives Preliminary Cost Estimate

Modeled Conditioned space	111,564	sf
Design Conditioned space	111,564	sf
Factor	1.0	

			Baseline	DEIR Proposed	Alternative 3 DEIR Env. VRF w/ DOAS Gas DHW	Alternative 4 DEIR Env. VRF w/ DOAS HP DHW	
Incremental Cost Increase							
VRF Cost premium (per sf)	$5.00	*Over baseline (and proposed) HVAC system*					
Indirect Hard Costs (15%)	$0.75						
Soft Costs and Financing (25%)	$1.44						
Total:	**$7.19**	per sf			**$802,145**	**$802,145**	**incremental cost above baseline*
MassSave Incentives	Gas			$6,712	$25,580	$27,972	
	Electric			$53,620	$109,375	$97,440	
	Total			**$60,332**	**$134,955**	**$125,412**	
Incentive Rate					**$74,623**	**$65,080**	*incremental incentive above DEIR proposed
Electricity [2]	$0.35	per kWh					
Natural Gas [3]	$1.85	per Therm					
Effective Cost Increase				n/a	**$727,522**	**$737,065**	**over proposed case*
Annual Operational Savings	Gas			$4,172	$15,901	$17,388	
	Electric			$24,512	$50,000	$44,544	
	Alternative Energy Credits			$0.00	$3,816	$3,816	
	Total			**$28,684**	**$69,717**	**$65,748**	
Cost of Electricity					**$41,033**	**$37,064**	*incremental operational savings above DEIR proposed
Electricity	$0.16	per kWh					
Natural Gas	$1.15	per Therm					
Simple Payback		in years			**17.7**	**19.9**	
(if operational savings were realized by the owner)							

Model Group 4 (Small Office Building D4.1) Electric Alternatives

Modeled Conditioned space	29,767	sf
Design Conditioned space	29,767	sf
Factor	1.0	

		Baseline	FEIR Proposed	DEIR Proposed	Alternative 3 VRF w/ DOAS HP DHW
DIRECT (NATURAL GAS)		MMBtu/yr	MMBtu/yr	MMBtu/yr	MMBtu/yr
Space Heating		716	511	576	201
Domestic Hot Water		0	0	0	0
Misc. Equipment		0	0	0	0
	subtotal	716	511	576	201
INDIRECT (ELECTRICITY)		MWh/yr	MWh/yr	MWh/yr	MWh/yr
Space Cooling		55	35	36	20
Space Heating		0	0	0	7
Domestic Hot Water		12	8	8	8
Fans Interior		66	59	62	39
Pumps		7	5	5	13
Heat Rejection		0	0	0	0
Internal Lighting		56	47	47	47
Misc. Equipment		124	124	124	124
	subtotal	320	278	281	256

ENERGY USE INDEX	PNNL reference[3]	kBtu/sf/yr	kBtu/sf/yr	kBtu/sf/yr	kBtu/sf/yr
	28.5	60.8	49.0	51.6	36.1
Diff, % (compared to baseline)			**-19%**	**-15%**	**-41%**

GHG EMISSIONS		tons/yr	tons/yr	tons/yr	tons/yr
Direct	Gas-burning	42	30	34	12
Indirect	Electricity	114	99	100	91
	Total	156	129	134	103
	Diff, tpy		**-27**	**-22**	**-53**
Diff, % (compared to baseline)			**-17.4%**	**-14.2%**	**-34.0%**

CO_2 Emission Factors:

Electricity [1]	710	lb/MWh
Natural Gas [2]	117	lb/MMBtu

[1] 2016 ISO New England Electric Generator Air Emissions Report

[2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)

[3] Pacific Northwest National Laboratory study, Massachusetts Zone 5A, ASHRAE 90.1-2013, Small Office

Model Group 4 (Small Office Building D4.1) Electric Alternatives Preliminary Cost Estimate

Modeled Conditioned space	29,767	sf
Design Conditioned space	29,767	sf
Factor	1.0	

		Baseline	Proposed (Elec Resist DHW)	Alternative 3 DEIR Env. w/ DOAS VRF HP DHW	
Incremental Cost Increase					
VRF Cost premium (per sf)	$5.00	*Over baseline (and proposed) HVAC system*			
Indirect Hard Costs (15%)	$0.75				
Soft Costs and Financing (25%)	$1.44				
Total:	**$7.19**			**$214,025**	**incremental cost above baseline*
MassSave Incentives	Gas		$2,584	$9,522	
	Electric		$13,685	$22,470	
	Total		**$16,269**	**$31,992**	
				$15,723	**incremental incentive above proposed*
Incentive Rate					
Electricity [2]	$0.35	per kWh			
Natural Gas [3]	$1.85	per Therm			
Effective Cost Increase			n/a	**$198,302**	**over proposed case*
AnnualOperational Savings	Gas		$1,607	$5,919	
	Electric		$6,256	$10,272	
	Alternative Energy Credits		$0	$2,739	
	Total		**$7,863**	**$18,930**	
Cost of Electricity				**$11,068**	**incremental operational savings above proposed*
Electricity	$0.16	per kWh			
Natural Gas	$1.15	per Therm			
Simple Payback	in years			**17.9**	
(if operational savings were realized by the owner)					

Model Group 5 (Hotel D1.1) Electric Alternatives

Modeled Conditioned space	111,258	sf
Design Conditioned space	111,258	sf
Factor	1.0	

		Baseline	FEIR Proposed	DEIR Proposed	Alternative 3 VRF w/ DOAS Gas DHW	Alternative 4 VRF w/ DOAS HP DHW
DIRECT (NATURAL GAS)		MMBtu/yr	MMBtu/yr	MMBtu/yr	MMBtu/yr	MMBtu/yr
Space Heating		2,816	1,467	1,475	1,431	1,431
Domestic Hot Water		8,508	6,118	6,118	6,118	0
Misc. Equipment		0	0	0	0	0
	subtotal	11,324	7,585	7,593	7,549	1,431
INDIRECT (ELECTRICITY)		MWh/yr	MWh/yr	MWh/yr	MWh/yr	MWh/yr
Space Cooling		227	336	324	135	135
Space Heating		0	65	67	16	16
Domestic Hot Water		3	0	0	0	1,652
Fans Interior		272	237	236	241	241
Pumps		28	59	58	17	17
Heat Rejection		0	3	3	0	0
Internal Lighting		323	291	291	291	291
Misc. Equipment		416	416	416	416	416
	subtotal	1,267	1,407	1,395	1,115	2,767
ENERGY USE INDEX	PNNL reference[3]	kBtu/sf/yr	kBtu/sf/yr	kBtu/sf/yr	kBtu/sf/yr	kBtu/sf/yr
	61.3	140.6	111.3	111.0	102.0	97.7
	Diff, % (compared to baseline)		**-21%**	**-21%**	**-27%**	**-31%**
GHG EMISSIONS		tons/yr	tons/yr	tons/yr	tons/yr	tons/yr
Direct	Gas-burning	662	444	444	442	84
Indirect	Electricity	450	500	495	396	982
	Total	1,112	943	940	837	1,066
	Diff, tpy		**-169**	**-173**	**-275**	**-46**
	Diff, % (compared to baseline)		**-15.2%**	**-15.5%**	**-24.7%**	**-4.2%**

CO_2 Emission Factors:

Electricity [1]	710	lb/MWh
Natural Gas [2]	117	lb/MMBtu

[1] 2016 ISO New England Electric Generator Air Emissions Report

[2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)

[3] Pacific Northwest National Laboratory study, Massachusetts Zone 5A, ASHRAE 90.1-2013, Small Hotel

Model Group 5 (Hotel D1.1) Electric Alternatives Preliminary Cost Estimate

Modeled Conditioned space	111,258	sf
Design Conditioned space	111,258	sf
Factor	1.0	

			Baseline	DEIR Proposed	Alternative 3 DEIR Env. VRF w/ DOAS Gas DHW	Alternative 4 DEIR Env. VRF w/ DOAS HP DHW
Incremental Cost Increase						
VRF Cost premium (per unit)	$3,000	*- over proposed system*				
Indirect Hard Costs (15%)	$750					
Soft Costs and Financing (25%)	$1,250					
Total:	**$5,000**	**$875,000**				
Number of units with VRF	175					
MassSave Incentives	Gas			$69,009	$69,823	$183,011
	Electric			-	$53,410	-
	Total			**$69,009**	**$123,233**	**$183,011**
Incentive Rate						
Electricity [2]	$0.35	per kWh				
Natural Gas [3]	$1.85	per Therm				
Effective Cost Increase				n/a	**$820,776**	**$760,997**
AnnualOperational Savings	Gas			$42,897	$43,403	$113,764
	Electric			-$20,496	$24,416	-$239,952
	Alternative Energy Credits			$0.00	$18,149	$18,149
	Total			**$22,401**	**$85,968**	**-$108,039**
Cost of Electricity						
Electricity	$0.16	per kWh				
Natural Gas	$1.15	per Therm				
Simple Payback	in years				**12.9**	**n/a***
(if operational savings were realized by the owner)						**Does not pay back*

Model Group 6 (Large Residential Building D2.2-2.3) Electric Alternatives

Modeled Conditioned space	394,694	sf
Design Conditioned space	394,694	sf
Factor	1.0	

		Baseline	FEIR Proposed	DEIR Proposed	Alternative 3 VRF w/ DOAS[1] HP DHW
DIRECT (NATURAL GAS)		MMBtu/yr	MMBtu/yr	MMBtu/yr	MMBtu/yr
Space Heating		9,161	961	1,059	645
Domestic Hot Water		7,175	3,915	3,915	2,781
	subtotal	16,337	4,876	4,974	3,426
INDIRECT (ELECTRICITY)		MWh/yr	MWh/yr	MWh/yr	MWh/yr
Space Cooling		1,345	1,195	1,213	1,116
Space Heating		0	155	172	175
Domestic Hot Water		2	0	0	237
Fans Interior		733	997	1,008	984
Pumps		9	330	343	320
Heat Rejection		0	12	13	13
Internal Lighting		1,267	1,148	1,148	1,148
Misc. Equipment		3,525	3,525	3,525	3,525
	subtotal	6,881	7,362	7,423	7,518
ENERGY USE INDEX	PNNL reference[4]	kBtu/sf/yr	kBtu/sf/yr	kBtu/sf/yr	kBtu/sf/yr
	47.6	100.9	76.0	76.8	73.7
Diff, % (compared to baseline)			**-25%**	**-24%**	**-27%**
GHG EMISSIONS		tons/yr	tons/yr	tons/yr	tons/yr
Direct	Gas-burning	956	285	291	200
Indirect	Electricity	2,443	2,614	2,635	2,669
	Total	3,398	2,899	2,926	2,869
	Diff, tpy		**-499**	**-472**	**-529**
Diff, % (compared to baseline)			**-14.7%**	**-13.9%**	**-15.6%**

CO_2 Emission Factors:

Electricity [2]	710	lb/MWh
Natural Gas [3]	117	lb/MMBtu

[1] VRF, heat pump water heater alternative in mid-rise residential (d2.2) only

[2] 2016 ISO New England Electric Generator Air Emissions Report

[3] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)

[4] Pacific Northwest National Laboratory study, Massachusetts Zone 5A, ASHRAE 90.1-2013, Mid-Rise Apt.

Model Group 6 (Large Residential Building D2.2-2.3) Electric Alternatives Preliminary Cost Estimate

Modeled Conditioned space	394,694	sf
Design Conditioned space	394,694	sf
Factor	1.0	

			Baseline	DEIR Proposed	Alternative 3 Proposed Env. VRF w/ DOAS HP DHW
Incremental Cost Increase					
VRF Cost premium (per unit)	$5,000	*- over proposed system*			
Indirect Hard Costs (15%)	$750				
Soft Costs and Financing (25%)	$1,250				
Total:	**$7,000**	**$945,000**			
Number of units with VRF	135	(mid-rise portion)			
MassSave Incentives	Gas			$210,204	$238,837
	Electric			-	-
	Total			**$210,204**	**$238,837**
Incentive Rate					
Electricity [2]	$0.35	per kWh			
Natural Gas [3]	$1.85	per Therm			
Alternative Energy Credits (AEC's)					
10-yr Upfront Minted, Scenario A					**$182,250**
Effective Cost Increase				n/a	**$734,118**
AnnualOperational Savings	Gas			$130,668	$148,466
	Electric			-$86,672	-$101,936
	Total			**$43,996**	**$46,530**
Cost of Electricity					
Electricity	$0.16	per kWh			
Natural Gas	$1.15	per Therm			
Simple Payback	in years				**289.6**
(if operational savings were realized by the owner)					

Model Group 7 (Large Residential Building 3.2) Electric Alternatives

Modeled Conditioned space	344,933	sf
Design Conditioned space	344,933	sf
Factor	1.0	

		Baseline	Proposed	Alternative 3 VRF w/ DOAS[1] HP DHW
DIRECT (NATURAL GAS)		MMBtu/yr	MMBtu/yr	MMBtu/yr
Space Heating		5,150	290	2
Domestic Hot Water		10,275	5,697	3,191
Misc. Equipment		0	0	0
	subtotal	15,425	5,988	3,193
INDIRECT (ELECTRICITY)		MWh/yr	MWh/yr	MWh/yr
Space Cooling		945	1,086	951
Space Heating		0	179	181
Domestic Hot Water		13	0	663
Fans Interior		706	670	652
Pumps		15	213	167
Heat Rejection		0	7	7
Internal Lighting		952	916	916
Misc. Equipment		2,490	2,490	2,490
	subtotal	5,120	5,561	6,028
ENERGY USE INDEX	PNNL reference[4]	kBtu/sf/yr	kBtu/sf/yr	kBtu/sf/yr
	47.6	95.4	72.4	68.9
Diff, % (compared to baseline)			**-24%**	**-28%**
GHG EMISSIONS		tons/yr	tons/yr	tons/yr
Direct	Gas-burning	902	350	187
Indirect	Electricity	1,818	1,974	2,140
	Total	2,720	2,324	2,327
	Diff, tpy		**-396**	**-393**
Diff, % (compared to baseline)			**-14.5%**	**-14.5%**

CO_2 Emission Factors:

Electricity [2]	710	lb/MWh
Natural Gas [3]	117	lb/MMBtu

[1] VRF, heat pump water heater alternative in mid-rise residential portion only

[2] 2016 ISO New England Electric Generator Air Emissions Report

[3] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)

[4] Pacific Northwest National Laboratory study, Massachusetts Zone 5A, ASHRAE 90.1-2013, Mid-Rise Apt.

Model Group 7 (Large Residential Building D3.2) Electric Alternatives Preliminary Cost Estimate

Modeled Conditioned space	344,933	sf
Design Conditioned space	344,933	sf
Factor	1.0	

		Baseline	Proposed	Alternative 3 Proposed Env. VRF w/ DOAS HP DHW
Incremental Cost Increase				
VRF Cost premium (per unit)	$5,000	*- over proposed system*		
Indirect Hard Costs (15%)	$750			
Soft Costs and Financing (25%)	$1,250			
Total:	**$7,000**	**$595,000**		
Number of units with VRF	85	(mid-rise portion)		
MassSave Incentives	Gas		$189,743	$276,233
	Electric		-	-
	Total		**$189,743**	**$276,233**
Incentive Rate				
Electricity [2]	$0.35	per kWh		
Natural Gas [3]	$1.85	per Therm		
Alternative Energy Credits (AEC's)				
10-yr Upfront Minted, Scenario A				**$114,750**
Effective Cost Increase			n/a	**$393,761**
AnnualOperational Savings	Gas		$117,949	$171,712
	Electric		-$70,464	-$226,752
	Total		**$47,485**	**-$55,040**
Cost of Electricity				
Electricity	$0.16	per kWh		
Natural Gas	$1.15	per Therm		
Simple Payback	in years			**n/a***
(if operational savings were realized by the owner)				**Does not pay back*

Model Group 8 (Mid-Rise Residential Building D4.3) Electric Alternatives

Modeled Conditioned space	61,307	sf
Design Conditioned space	61,307	sf
Factor	1.0	

		Baseline	Proposed	Alternative 3 Proposed Env. VRF w/ DOAS HP DHW
DIRECT (NATURAL GAS)		MMBtu/yr	MMBtu/yr	MMBtu/yr
Space Heating		967	644	508
Domestic Hot Water		2,471	1,563	1,563
Misc. Equipment		0	0	0
	subtotal	3,438	2,207	2,071
INDIRECT (ELECTRICITY)		MWh/yr	MWh/yr	MWh/yr
Space Cooling		147	148	89
Space Heating		0	0	1
Domestic Hot Water		4	2	2
Fans Interior		107	131	117
Pumps		14	16	4
Heat Rejection		0	0	0
Internal Lighting		181	172	172
Misc. Equipment		441	441	441
	subtotal	893	911	826
ENERGY USE INDEX	PNNL reference[3]	kBtu/sf/yr	kBtu/sf/yr	kBtu/sf/yr
	73.3	105.8	86.7	79.8
	Diff, % (compared to baseline)		**-18%**	**-25%**
GHG EMISSIONS		tons/yr	tons/yr	tons/yr
Direct	Gas-burning	201	129	121
Indirect	Electricity	317	323	293
	Total	518	452	414
	Diff, tpy		**-66**	**-104**
	Diff, % (compared to baseline)		**-12.7%**	**-20.0%**

CO_2 Emission Factors:

Electricity [1]	710	lb/MWh
Natural Gas [2]	117	lb/MMBtu

[1] 2016 ISO New England Electric Generator Air Emissions Report

[2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)

[3] Pacific Northwest National Laboratory study, Massachusetts Zone 5A, ASHRAE 90.1-2013, Mid-Rise Apt.

Model Group 8 (Mid-Rise Residential Building D4.3) Electric Alternatives Preliminary Cost Estimate

Modeled Conditioned space	61,307	sf
Design Conditioned space	61,307	sf
Factor	1.0	

		Baseline	Proposed	Alternative 3 Proposed Env. VRF w/ DOAS HP DHW
Incremental Cost Increase				
VRF Cost premium (per unit)	$5,000	**$240,000**	*- over proposed system*	
Indirect Hard Costs (15%)	$750			
Soft Costs and Financing (25%)	$1,250			
Total:	**$7,000**	**$336,000**		
Number of units	48			
MassSave Incentives	Gas		$22,785	$25,302
	Electric		-	$23,275
	Total		**$22,785**	**$48,577**
Incentive Rate				
Electricity [2]	$0.35 per kWh			
Natural Gas [3]	$1.85 per Therm			
Alternative Energy Credits (AEC's)				
10-yr Upfront Minted, Scenario A				**$64,800**
Effective Cost Increase			n/a	**$245,407**
AnnualOperational Savings	Gas		$14,163	$15,729
	Electric		-$2,832	$10,640
	Total		**$11,331**	**$26,369**
Cost of Electricity				
Electricity	$0.16 per kWh			
Natural Gas	$1.15 per Therm			
Simple Payback	in years			**16.3**
(if operational savings were realized by the owner)				

E.5 Electric Modeling Output (New Electric Alternatives Only)

Model Group 3

Model Group 4

Model Group 5

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	751.6	0.0	1381.8	32.5	322.2	0.0	25.2	448.7	0.0	0.6	126.6	0.0	3089.1
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	279.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	279.8
MBTU	751.6	0.0	1381.8	312.2	322.2	0.0	25.2	448.7	0.0	0.6	126.6	0.0	3368.9

TOTAL SITE ENERGY 3368.86 MBTU 30.2 KBTU/SQFT-YR GROSS-AREA 30.2 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 9547.03 MBTU 85.5 KBTU/SQFT-YR GROSS-AREA 85.5 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.00
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 0

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

US2 - D6.1 Alt 3 - VRF With HP DHW DOE-2.2-47h2 4/11/2019 14:09:07 BDL RUN 1
PROPOSED - FINAL
REPORT- BEPU Building Utility Performance WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY KWH	220212.	0.	404855.	9509.	94399.	0.	7373.	131460.	0.	188.	37105.	0.	905101.
FM1 NATURAL-GAS THERM	0.	0.	0.	2798.	0.	0.	0.	0.	0.	0.	0.	0.	2798.

TOTAL ELECTRICITY 905101. KWH 8.106 KWH /SQFT-YR GROSS-AREA 8.106 KWH /SQFT-YR NET-AREA
TOTAL NATURAL-GAS 2798. THERM 0.025 THERM /SQFT-YR GROSS-AREA 0.025 THERM /SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.00
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 0

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

US2 - D6.1 Alt 3 - VRF With HP DHW DOE-2.2-47h2 4/11/2019 14:09:07 BDL RUN 1
PROPOSED - FINAL
REPORT- PS-F Energy End-Use Summary for EM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
KWH	19265.	0.	34202.	764.	2861.	0.	739.	12401.	0.	19.	3141.	0.	73392.
MAX KW	70.548	0.000	90.907	25.868	11.531	0.000	1.380	30.321	0.000	2.710	12.691	0.000	203.767
DAY/HR	4/17	0/ 0	2/ 9	15/ 7	11/17	0/ 0	1/ 7	31/ 9	0/ 0	7/11	2/13	0/ 0	19/17
PEAK ENDUSE	68.635	0.000	83.158	8.668	8.735	0.000	1.380	22.589	0.000	0.735	9.867	0.000	
PEAK PCT	33.7	0.0	40.8	4.3	4.3	0.0	0.7	11.1	0.0	0.4	4.8	0.0	
FEB													
KWH	17034.	0.	30911.	871.	2679.	0.	667.	10721.	0.	26.	2840.	0.	65749.
MAX KW	65.163	0.000	90.907	28.461	12.246	0.000	1.380	30.127	0.000	3.793	12.691	0.000	195.313
DAY/HR	27/17	0/ 0	1/ 9	12/ 7	28/16	0/ 0	1/ 7	1/ 9	0/ 0	12/ 7	1/13	0/ 0	12/17
PEAK ENDUSE	65.128	0.000	83.158	4.998	8.952	0.000	1.380	21.830	0.000	0.000	9.867	0.000	
PEAK PCT	33.3	0.0	42.6	2.6	4.6	0.0	0.7	11.2	0.0	0.0	5.1	0.0	
MAR													
KWH	18892.	0.	34778.	832.	3374.	0.	743.	11060.	0.	21.	3200.	0.	72900.
MAX KW	67.808	0.000	90.907	20.060	16.460	0.000	1.380	27.851	0.000	2.335	12.691	0.000	193.655
DAY/HR	5/17	0/ 0	1/ 9	3/ 8	27/17	0/ 0	1/ 7	12/ 9	0/ 0	25/11	1/13	0/ 0	5/17
PEAK ENDUSE	67.808	0.000	83.158	0.000	8.423	0.000	1.380	23.021	0.000	0.000	9.865	0.000	
PEAK PCT	35.0	0.0	42.9	0.0	4.3	0.0	0.7	11.9	0.0	0.0	5.1	0.0	
APR													
KWH	17910.	0.	33496.	1840.	3964.	0.	713.	9611.	0.	39.	3075.	0.	70648.
MAX KW	55.916	0.000	90.907	28.569	37.576	0.000	1.380	27.548	0.000	3.656	12.691	0.000	215.934
DAY/HR	20/11	0/ 0	2/ 9	30/ 7	18/16	0/ 0	1/ 7	18/13	0/ 0	9/ 7	2/13	0/ 0	18/14
PEAK ENDUSE	54.910	0.000	83.927	0.000	37.154	0.000	1.380	26.343	0.000	0.000	12.219	0.000	
PEAK PCT	25.4	0.0	38.9	0.0	17.2	0.0	0.6	12.2	0.0	0.0	5.7	0.0	
MAY													
KWH	18475.	0.	34778.	314.	8318.	0.	657.	10460.	0.	0.	3190.	0.	76190.
MAX KW	55.133	0.000	90.907	17.410	66.432	0.000	1.380	31.163	0.000	0.000	12.691	0.000	243.719
DAY/HR	7/17	0/ 0	1/ 9	6/ 7	29/16	0/ 0	1/ 7	29/17	0/ 0	0/ 0	1/13	0/ 0	29/17
PEAK ENDUSE	54.911	0.000	83.158	0.000	64.260	0.000	0.380	31.163	0.000	0.000	9.847	0.000	
PEAK PCT	22.5	0.0	34.1	0.0	26.4	0.0	0.2	12.8	0.0	0.0	4.0	0.0	
JUN													
KWH	17699.	0.	33482.	0.	13745.	0.	409.	11031.	0.	0.	3064.	0.	79429.
MAX KW	54.977	0.000	90.907	0.256	75.500	0.000	1.380	33.220	0.000	0.000	12.691	0.000	256.380
DAY/HR	26/17	0/ 0	1/ 9	7/ 7	11/16	0/ 0	1/ 7	11/17	0/ 0	0/ 0	1/13	0/ 0	11/17
PEAK ENDUSE	54.910	0.000	83.158	0.000	74.868	0.000	0.380	33.220	0.000	0.000	9.844	0.000	
PEAK PCT	21.4	0.0	32.4	0.0	29.2	0.0	0.1	13.0	0.0	0.0	3.8	0.0	
JUL													
KWH	18123.	0.	34209.	0.	19292.	0.	466.	12030.	0.	0.	3122.	0.	87242.
MAX KW	54.974	0.000	90.907	0.000	83.056	0.000	1.380	34.813	0.000	0.000	12.691	0.000	266.624
DAY/HR	31/10	0/ 0	2/ 9	0/ 0	20/16	0/ 0	2/ 7	20/17	0/ 0	0/ 0	2/13	0/ 0	20/17
PEAK ENDUSE	54.910	0.000	83.158	0.000	82.522	0.000	1.380	34.813	0.000	0.000	9.841	0.000	
PEAK PCT	20.6	0.0	31.2	0.0	31.0	0.0	0.5	13.1	0.0	0.0	3.7	0.0	
AUG													
KWH	18794.	0.	35347.	0.	17341.	0.	389.	11875.	0.	0.	3243.	0.	86988.
MAX KW	55.562	0.000	90.907	0.000	72.275	0.000	1.380	33.183	0.000	0.000	12.691	0.000	253.463
DAY/HR	9/10	0/ 0	1/ 9	0/ 0	23/16	0/ 0	8/11	23/17	0/ 0	0/ 0	1/13	0/ 0	23/17
PEAK ENDUSE	54.910	0.000	83.158	0.000	71.988	0.000	0.380	33.183	0.000	0.000	9.843	0.000	
PEAK PCT	21.7	0.0	32.8	0.0	28.4	0.0	0.1	13.1	0.0	0.0	3.9	0.0	

SEP													
KWH	17425.	0.	32344.	29.	11047.	0.	411.	10488.	0.	0.	2944.	0.	74687.
MAX KW	57.021	0.000	90.907	5.447	71.897	0.000	1.380	33.317	0.000	0.000	12.691	0.000	248.387
DAY/HR	27/17	0/ 0	4/ 9	29/ 7	14/16	0/ 0	1/11	14/16	0/ 0	0/ 0	4/13	0/ 0	14/17
PEAK ENDUSE	54.910	0.000	83.158	0.000	67.066	0.000	0.380	33.027	0.000	0.000	9.844	0.000	
PEAK PCT	22.1	0.0	33.5	0.0	27.0	0.0	0.2	13.3	0.0	0.0	4.0	0.0	
OCT													
KWH	18979.	0.	34778.	899.	5495.	0.	736.	10049.	0.	4.	3190.	0.	74130.
MAX KW	59.119	0.000	90.907	22.472	38.185	0.000	1.380	27.979	0.000	2.594	12.691	0.000	214.058
DAY/HR	26/17	0/ 0	1/ 9	30/ 7	3/12	0/ 0	1/ 7	18/16	0/ 0	30/ 7	23/13	0/ 0	18/17
PEAK ENDUSE	58.298	0.000	83.158	0.000	33.670	0.000	1.380	27.700	0.000	0.000	9.851	0.000	
PEAK PCT	27.2	0.0	38.8	0.0	15.7	0.0	0.6	12.9	0.0	0.0	4.6	0.0	
NOV													
KWH	18513.	0.	32906.	2306.	3255.	0.	712.	10101.	0.	38.	3016.	0.	70847.
MAX KW	70.548	0.000	90.907	29.494	21.319	0.000	1.380	28.733	0.000	4.011	12.691	0.000	205.341
DAY/HR	23/17	0/ 0	1/ 9	25/ 7	9/14	0/ 0	1/ 7	20/ 9	0/ 0	25/ 7	1/13	0/ 0	5/17
PEAK ENDUSE	69.758	0.000	83.158	9.349	8.558	0.000	1.380	22.512	0.000	0.765	9.860	0.000	
PEAK PCT	34.0	0.0	40.5	4.6	4.2	0.0	0.7	11.0	0.0	0.4	4.8	0.0	
DEC													
KWH	19103.	0.	33626.	1654.	3029.	0.	735.	11634.	0.	39.	3080.	0.	72900.
MAX KW	70.548	0.000	90.907	34.167	14.874	0.000	1.380	30.034	0.000	4.002	12.691	0.000	207.640
DAY/HR	10/17	0/ 0	3/ 9	27/ 7	6/14	0/ 0	1/ 7	24/ 8	0/ 0	27/ 7	3/13	0/ 0	13/17
PEAK ENDUSE	70.482	0.000	83.158	10.282	8.825	0.000	1.380	22.777	0.000	0.870	9.865	0.000	
PEAK PCT	33.9	0.0	40.0	5.0	4.3	0.0	0.7	11.0	0.0	0.4	4.8	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
KWH	220212.	0.	404855.	9509.	94399.	0.	7373.	131460.	0.	188.	37105.	0.	905101.
MAX KW	70.548	0.000	90.907	34.167	83.056	0.000	1.380	34.813	0.000	4.011	12.691	0.000	266.624
MON/DY	1/ 4	0/ 0	1/ 2	12/27	7/20	0/ 0	1/ 1	7/20	0/ 0	11/25	10/23	0/ 0	7/20
PEAK ENDUSE	54.910	0.000	83.158	0.000	82.522	0.000	1.380	34.813	0.000	0.000	9.841	0.000	
PEAK PCT	20.6	0.0	31.2	0.0	31.0	0.0	0.5	13.1	0.0	0.0	3.7	0.0	

YEARLY TRANSFORMER LOSSES = 0.0 KWH

REPORT- PS-F Energy End-Use Summary for FM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
THERM	0.	0.	0.	721.	0.	0.	0.	0.	0.	0.	0.	0.	721.
MAX THERM/HR	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
DAY/HR	0/ 0	0/ 0	0/ 0	31/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	31/ 7
PEAK ENDUSE	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
FEB													
THERM	0.	0.	0.	566.	0.	0.	0.	0.	0.	0.	0.	0.	566.
MAX THERM/HR	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9
DAY/HR	0/ 0	0/ 0	0/ 0	17/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	17/ 7
PEAK ENDUSE	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAR													
THERM	0.	0.	0.	416.	0.	0.	0.	0.	0.	0.	0.	0.	416.
MAX THERM/HR	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5
DAY/HR	0/ 0	0/ 0	0/ 0	18/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	18/ 7
PEAK ENDUSE	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
APR													
THERM	0.	0.	0.	153.	0.	0.	0.	0.	0.	0.	0.	0.	153.
MAX THERM/HR	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 7
PEAK ENDUSE	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAY													
THERM	0.	0.	0.	18.	0.	0.	0.	0.	0.	0.	0.	0.	18.
MAX THERM/HR	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
DAY/HR	0/ 0	0/ 0	0/ 0	1/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 7
PEAK ENDUSE	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUN													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	8/10	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	8/10
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUL													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AUG													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

SEP													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
DAY/HR	0/ 0	0/ 0	0/ 0	29/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	29/ 7
PEAK ENDUSE	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
OCT													
THERM	0.	0.	0.	40.	0.	0.	0.	0.	0.	0.	0.	0.	40.
MAX THERM/HR	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
DAY/HR	0/ 0	0/ 0	0/ 0	13/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	13/ 7
PEAK ENDUSE	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NOV													
THERM	0.	0.	0.	298.	0.	0.	0.	0.	0.	0.	0.	0.	298.
MAX THERM/HR	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3
DAY/HR	0/ 0	0/ 0	0/ 0	20/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	20/ 7
PEAK ENDUSE	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
DEC													
THERM	0.	0.	0.	585.	0.	0.	0.	0.	0.	0.	0.	0.	585.
MAX THERM/HR	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3
DAY/HR	0/ 0	0/ 0	0/ 0	25/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	25/ 7
PEAK ENDUSE	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
THERM	0.	0.	0.	2798.	0.	0.	0.	0.	0.	0.	0.	0.	2798.
MAX THERM/HR	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3
MON/DY	0/ 0	0/ 0	0/ 0	12/25	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	12/25
PEAK ENDUSE	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	158.9	0.0	422.4	22.3	68.5	0.0	42.4	131.5	0.0	0.4	26.8	0.0	873.3
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	201.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	201.2
MBTU	158.9	0.0	422.4	223.5	68.5	0.0	42.4	131.5	0.0	0.4	26.8	0.0	1074.5

TOTAL SITE ENERGY 1074.49 MBTU 35.9 KBTU/SQFT-YR GROSS-AREA 35.9 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 2821.09 MBTU 94.1 KBTU/SQFT-YR GROSS-AREA 94.1 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.11
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 131

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

US2 - D4.1 Alt 3 - VRF - HP DHW DOE-2.2-47h2 4/11/2019 14:16:30 BDL RUN 1
PROPOSED - FINAL WEATHER FILE- Boston MA TMY2
REPORT- BEPU Building Utility Performance

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY KWH	46548.	0.	123772.	6547.	20074.	0.	12419.	38543.	0.	127.	7847.	0.	255876.
FM1 NATURAL-GAS THERM	0.	0.	0.	2012.	0.	0.	0.	0.	0.	0.	0.	0.	2012.

TOTAL ELECTRICITY	255876. KWH	8.539 KWH	/SQFT-YR GROSS-AREA	8.539 KWH	/SQFT-YR NET-AREA
TOTAL NATURAL-GAS	2012. THERM	0.067 THERM	/SQFT-YR GROSS-AREA	0.067 THERM	/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.11
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 131

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

REPORT- PS-F Energy End-Use Summary for EM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
KWH	4258.	0.	10462.	664.	1.	0.	1195.	3753.	0.	14.	655.	0.	21001.
MAX KW	17.935	0.000	30.899	42.521	0.109	0.000	2.380	15.400	0.000	2.081	2.697	0.000	70.012
DAY/HR	4/17	0/ 0	2/ 9	15/ 7	26/16	0/ 0	1/ 7	6/ 7	0/ 0	7/11	25/13	0/ 0	11/10
PEAK ENDUSE	12.326	0.000	26.147	18.169	0.000	0.000	2.380	7.498	0.000	1.644	1.848	0.000	
PEAK PCT	17.6	0.0	37.3	26.0	0.0	0.0	3.4	10.7	0.0	2.3	2.6	0.0	
FEB													
KWH	3654.	0.	9453.	684.	5.	0.	1079.	3173.	0.	18.	594.	0.	18660.
MAX KW	15.973	0.000	30.899	46.548	0.636	0.000	2.380	15.450	0.000	5.680	2.697	0.000	76.872
DAY/HR	27/17	0/ 0	1/ 9	12/ 7	28/16	0/ 0	1/ 7	1/ 7	0/ 0	12/ 7	8/13	0/ 0	12/ 7
PEAK ENDUSE	1.755	0.000	7.702	46.548	0.000	0.000	2.380	12.471	0.000	5.680	0.336	0.000	
PEAK PCT	2.3	0.0	10.0	60.6	0.0	0.0	3.1	16.2	0.0	7.4	0.4	0.0	
MAR													
KWH	4002.	0.	10645.	570.	80.	0.	1202.	3035.	0.	12.	676.	0.	20223.
MAX KW	16.937	0.000	30.899	25.763	3.047	0.000	2.380	15.358	0.000	1.640	2.697	0.000	57.280
DAY/HR	5/17	0/ 0	1/ 9	4/ 7	27/17	0/ 0	1/ 7	11/ 7	0/ 0	27/ 8	1/14	0/ 0	29/ 9
PEAK ENDUSE	10.688	0.000	30.899	6.432	0.000	0.000	2.380	5.183	0.000	0.000	1.699	0.000	
PEAK PCT	18.7	0.0	53.9	11.2	0.0	0.0	4.2	9.0	0.0	0.0	3.0	0.0	
APR													
KWH	3705.	0.	10243.	1199.	303.	0.	1135.	2375.	0.	27.	654.	0.	19642.
MAX KW	12.433	0.000	30.899	36.895	11.240	0.000	2.380	13.328	0.000	4.089	2.697	0.000	63.887
DAY/HR	20/11	0/ 0	2/ 9	30/ 7	18/14	0/ 0	1/ 7	2/ 7	0/ 0	9/ 7	10/14	0/ 0	23/ 9
PEAK ENDUSE	9.542	0.000	30.899	12.711	0.000	0.000	2.380	6.653	0.000	0.000	1.701	0.000	
PEAK PCT	14.9	0.0	48.4	19.9	0.0	0.0	3.7	10.4	0.0	0.0	2.7	0.0	
MAY													
KWH	3789.	0.	10639.	133.	1956.	0.	1045.	2901.	0.	0.	678.	0.	21142.
MAX KW	11.351	0.000	30.899	19.202	18.950	0.000	2.380	10.557	0.000	0.000	2.697	0.000	71.205
DAY/HR	14/17	0/ 0	1/ 9	6/ 7	29/16	0/ 0	1/ 7	29/17	0/ 0	0/ 0	8/13	0/ 0	29/17
PEAK ENDUSE	10.934	0.000	26.724	0.000	18.476	0.000	2.380	10.557	0.000	0.000	2.134	0.000	
PEAK PCT	15.4	0.0	37.5	0.0	25.9	0.0	3.3	14.8	0.0	0.0	3.0	0.0	
JUN													
KWH	3596.	0.	10238.	0.	3723.	0.	899.	3500.	0.	0.	651.	0.	22607.
MAX KW	11.055	0.000	30.899	0.000	22.873	0.000	2.380	11.651	0.000	0.000	2.697	0.000	76.616
DAY/HR	26/17	0/ 0	1/ 9	0/ 0	11/17	0/ 0	1/ 9	11/17	0/ 0	0/ 0	4/13	0/ 0	11/17
PEAK ENDUSE	10.855	0.000	26.724	0.000	22.873	0.000	2.380	11.651	0.000	0.000	2.134	0.000	
PEAK PCT	14.2	0.0	34.9	0.0	29.9	0.0	3.1	15.2	0.0	0.0	2.8	0.0	
JUL													
KWH	3692.	0.	10449.	0.	5324.	0.	855.	4089.	0.	0.	662.	0.	25071.
MAX KW	11.038	0.000	30.899	0.000	25.121	0.000	2.380	12.229	0.000	0.000	2.697	0.000	79.198
DAY/HR	31/10	0/ 0	2/ 9	0/ 0	20/16	0/ 0	2/21	20/17	0/ 0	0/ 0	9/13	0/ 0	20/14
PEAK ENDUSE	10.683	0.000	27.108	0.000	24.460	0.000	2.380	11.873	0.000	0.000	2.694	0.000	
PEAK PCT	13.5	0.0	34.2	0.0	30.9	0.0	3.0	15.0	0.0	0.0	3.4	0.0	
AUG													
KWH	3848.	0.	10829.	0.	4684.	0.	823.	3961.	0.	0.	690.	0.	24835.
MAX KW	12.207	0.000	30.899	0.000	21.426	0.000	2.380	11.365	0.000	0.000	2.697	0.000	75.361
DAY/HR	9/10	0/ 0	1/ 9	0/ 0	23/16	0/ 0	1/14	29/16	0/ 0	0/ 0	2/13	0/ 0	28/14
PEAK ENDUSE	10.633	0.000	27.108	0.000	21.420	0.000	2.380	11.125	0.000	0.000	2.694	0.000	
PEAK PCT	14.1	0.0	36.0	0.0	28.4	0.0	3.2	14.8	0.0	0.0	3.6	0.0	

SEP													
KWH	3628.	0.	9858.	0.	2844.	0.	765.	3191.	0.	0.	624.	0.	20910.
MAX KW	13.540	0.000	30.899	0.000	21.531	0.000	2.380	11.307	0.000	0.000	2.697	0.000	74.052
DAY/HR	26/18	0/ 0	4/ 9	0/ 0	14/16	0/ 0	1/ 7	14/16	0/ 0	0/ 0	5/13	0/ 0	14/14
PEAK ENDUSE	10.630	0.000	27.108	0.000	20.268	0.000	2.380	10.972	0.000	0.000	2.694	0.000	
PEAK PCT	14.4	0.0	36.6	0.0	27.4	0.0	3.2	14.8	0.0	0.0	3.6	0.0	
OCT													
KWH	4025.	0.	10639.	318.	1065.	0.	1101.	2562.	0.	2.	678.	0.	20390.
MAX KW	14.283	0.000	30.899	19.427	9.861	0.000	2.380	8.556	0.000	1.408	2.697	0.000	57.823
DAY/HR	23/18	0/ 0	1/ 9	14/ 7	3/12	0/ 0	1/ 7	18/16	0/ 0	30/ 7	22/13	0/ 0	19/14
PEAK ENDUSE	10.616	0.000	27.108	0.000	7.263	0.000	2.043	8.098	0.000	0.000	2.695	0.000	
PEAK PCT	18.4	0.0	46.9	0.0	12.6	0.0	3.5	14.0	0.0	0.0	4.7	0.0	
NOV													
KWH	4088.	0.	10049.	1641.	75.	0.	1138.	2640.	0.	30.	639.	0.	20302.
MAX KW	17.935	0.000	30.899	45.218	4.266	0.000	2.380	15.153	0.000	5.574	2.697	0.000	75.220
DAY/HR	23/17	0/ 0	1/ 9	25/ 7	1/16	0/ 0	1/ 7	20/ 7	0/ 0	25/ 7	2/13	0/ 0	25/ 7
PEAK ENDUSE	1.749	0.000	7.641	45.218	0.000	0.000	2.380	12.322	0.000	5.574	0.336	0.000	
PEAK PCT	2.3	0.0	10.2	60.1	0.0	0.0	3.2	16.4	0.0	7.4	0.4	0.0	
DEC													
KWH	4264.	0.	10266.	1338.	13.	0.	1182.	3362.	0.	24.	645.	0.	21093.
MAX KW	17.935	0.000	30.899	48.385	0.759	0.000	2.380	15.707	0.000	5.255	2.697	0.000	77.857
DAY/HR	10/17	0/ 0	3/ 9	27/ 7	15/13	0/ 0	1/11	24/ 7	0/ 0	27/ 7	19/13	0/ 0	27/ 7
PEAK ENDUSE	1.761	0.000	7.702	48.385	0.000	0.000	2.380	12.037	0.000	5.255	0.336	0.000	
PEAK PCT	2.3	0.0	9.9	62.1	0.0	0.0	3.1	15.5	0.0	6.7	0.4	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
KWH	46548.	0.	123772.	6547.	20074.	0.	12419.	38543.	0.	127.	7847.	0.	255876.
MAX KW	17.935	0.000	30.899	48.385	25.121	0.000	2.380	15.707	0.000	5.680	2.697	0.000	79.198
MON/DY	1/ 4	0/ 0	1/ 2	12/27	7/20	0/ 0	1/ 1	12/24	0/ 0	2/12	1/25	0/ 0	7/20
PEAK ENDUSE	10.683	0.000	27.108	0.000	24.460	0.000	2.380	11.873	0.000	0.000	2.694	0.000	
PEAK PCT	13.5	0.0	34.2	0.0	30.9	0.0	3.0	15.0	0.0	0.0	3.4	0.0	

YEARLY TRANSFORMER LOSSES = 0.0 KWH

REPORT- PS-F Energy End-Use Summary for FM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
THERM	0.	0.	0.	383.	0.	0.	0.	0.	0.	0.	0.	0.	383.
MAX THERM/HR	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
DAY/HR	0/ 0	0/ 0	0/ 0	31/ 9	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	31/ 9
PEAK ENDUSE	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
FEB													
THERM	0.	0.	0.	326.	0.	0.	0.	0.	0.	0.	0.	0.	326.
MAX THERM/HR	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
DAY/HR	0/ 0	0/ 0	0/ 0	17/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	17/ 7
PEAK ENDUSE	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAR													
THERM	0.	0.	0.	301.	0.	0.	0.	0.	0.	0.	0.	0.	301.
MAX THERM/HR	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
DAY/HR	0/ 0	0/ 0	0/ 0	18/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	18/ 7
PEAK ENDUSE	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
APR													
THERM	0.	0.	0.	205.	0.	0.	0.	0.	0.	0.	0.	0.	205.
MAX THERM/HR	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 7
PEAK ENDUSE	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAY													
THERM	0.	0.	0.	75.	0.	0.	0.	0.	0.	0.	0.	0.	75.
MAX THERM/HR	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
DAY/HR	0/ 0	0/ 0	0/ 0	1/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 7
PEAK ENDUSE	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUN													
THERM	0.	0.	0.	21.	0.	0.	0.	0.	0.	0.	0.	0.	21.
MAX THERM/HR	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
DAY/HR	0/ 0	0/ 0	0/ 0	6/19	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	6/19
PEAK ENDUSE	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUL													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
DAY/HR	0/ 0	0/ 0	0/ 0	26/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	26/ 7
PEAK ENDUSE	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AUG													
THERM	0.	0.	0.	3.	0.	0.	0.	0.	0.	0.	0.	0.	3.
MAX THERM/HR	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 7
PEAK ENDUSE	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

SEP													
THERM	0.	0.	0.	18.	0.	0.	0.	0.	0.	0.	0.	0.	18.
MAX THERM/HR	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
DAY/HR	0/ 0	0/ 0	0/ 0	29/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	29/ 7
PEAK ENDUSE	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
OCT													
THERM	0.	0.	0.	112.	0.	0.	0.	0.	0.	0.	0.	0.	112.
MAX THERM/HR	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
DAY/HR	0/ 0	0/ 0	0/ 0	27/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	27/ 7
PEAK ENDUSE	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NOV													
THERM	0.	0.	0.	237.	0.	0.	0.	0.	0.	0.	0.	0.	237.
MAX THERM/HR	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
DAY/HR	0/ 0	0/ 0	0/ 0	20/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	20/ 7
PEAK ENDUSE	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
DEC													
THERM	0.	0.	0.	330.	0.	0.	0.	0.	0.	0.	0.	0.	330.
MAX THERM/HR	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
DAY/HR	0/ 0	0/ 0	0/ 0	24/ 9	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	24/ 9
PEAK ENDUSE	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
THERM	0.	0.	0.	2012.	0.	0.	0.	0.	0.	0.	0.	0.	2012.
MAX THERM/HR	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
MON/DY	0/ 0	0/ 0	0/ 0	12/24	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	12/24
PEAK ENDUSE	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	994.7	0.0	1418.5	53.1	459.3	0.0	56.2	822.3	0.0	0.9	5639.3	0.0	9444.4
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hote NATURAL-GAS													
MBTU	0.0	0.0	0.0	1431.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1431.1
MBTU	994.7	0.0	1418.5	1484.2	459.3	0.0	56.2	822.3	0.0	0.9	5639.3	0.0	10875.5

TOTAL SITE ENERGY 10875.47 MBTU 97.8 KBTU/SQFT-YR GROSS-AREA 97.8 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 29764.24 MBTU 267.5 KBTU/SQFT-YR GROSS-AREA 267.5 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.57
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 3
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 47

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

US2 - D1.1 Alt 3 - VRF - HP DHW DOE-2.2-47h2 4/11/2019 14:33:50 BDL RUN 1
PROPOSED - FINAL
REPORT- BEPU Building Utility Performance WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY KWH	291447.	0.	415617.	15561.	134566.	0.	16470.	240942.	0.	275.	1652322.	0.	2767200.
FM1 NATURAL-GAS THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Hote NATURAL-GAS THERM	0.	0.	0.	14311.	0.	0.	0.	0.	0.	0.	0.	0.	14311.

TOTAL ELECTRICITY	2767200.	KWH	24.872	KWH	/SQFT-YR GROSS-AREA	24.872 KWH	/SQFT-YR NET-AREA
TOTAL NATURAL-GAS	14311.	THERM	0.129	THERM	/SQFT-YR GROSS-AREA	0.129 THERM	/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.57
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 3
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 47

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

US2 - D1.1 Alt 3 - VRF - HP DHW DOE-2.2-47h2 4/11/2019 14:33:50 BDL RUN 1
PROPOSED - FINAL
REPORT- PS-F Energy End-Use Summary for EM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
KWH	24690.	0.	35303.	1227.	4049.	0.	1629.	20320.	0.	30.	140303.	0.	227552.
MAX KW	79.079	0.000	108.785	28.770	18.141	0.000	2.190	36.830	0.000	2.894	455.903	0.000	649.249
DAY/HR	2/21	0/ 0	1/ 9	15/ 7	1/14	0/ 0	1/ 1	31/ 9	0/ 0	7/19	28/ 9	0/ 0	31/ 8
PEAK ENDUSE	43.943	0.000	108.444	0.000	5.910	0.000	2.190	32.937	0.000	0.000	455.825	0.000	
PEAK PCT	6.8	0.0	16.7	0.0	0.9	0.0	0.3	5.1	0.0	0.0	70.2	0.0	
FEB													
KWH	22307.	0.	31886.	1274.	4090.	0.	1472.	17871.	0.	31.	126735.	0.	205667.
MAX KW	79.079	0.000	108.785	26.622	19.500	0.000	2.190	35.953	0.000	2.592	455.910	0.000	662.489
DAY/HR	1/21	0/ 0	3/ 9	25/ 6	28/14	0/ 0	1/ 1	1/ 9	0/ 0	25/ 1	25/ 9	0/ 0	28/ 8
PEAK ENDUSE	43.943	0.000	108.444	18.954	6.574	0.000	2.190	24.897	0.000	1.655	455.832	0.000	
PEAK PCT	6.6	0.0	16.4	2.9	1.0	0.0	0.3	3.8	0.0	0.2	68.8	0.0	
MAR													
KWH	24888.	0.	35290.	884.	5609.	0.	1629.	19189.	0.	24.	140426.	0.	227939.
MAX KW	79.079	0.000	108.785	20.847	27.132	0.000	2.190	38.338	0.000	1.951	455.912	0.000	654.920
DAY/HR	1/21	0/ 0	3/ 9	30/ 5	27/17	0/ 0	1/ 1	27/17	0/ 0	30/ 5	25/ 9	0/ 0	30/ 8
PEAK ENDUSE	43.943	0.000	108.444	10.737	8.026	0.000	2.190	24.996	0.000	0.750	455.834	0.000	
PEAK PCT	6.7	0.0	16.6	1.6	1.2	0.0	0.3	3.8	0.0	0.1	69.6	0.0	
APR													
KWH	24024.	0.	34156.	2595.	6916.	0.	1553.	17533.	0.	48.	135862.	0.	222687.
MAX KW	79.079	0.000	108.785	27.873	43.441	0.000	2.190	41.482	0.000	2.607	455.912	0.000	655.971
DAY/HR	2/21	0/ 0	1/ 9	21/ 7	18/14	0/ 0	1/ 2	27/17	0/ 0	21/ 7	1/ 9	0/ 0	10/ 8
PEAK ENDUSE	43.943	0.000	108.444	11.092	7.942	0.000	2.190	25.642	0.000	0.887	455.832	0.000	
PEAK PCT	6.7	0.0	16.5	1.7	1.2	0.0	0.3	3.9	0.0	0.1	69.5	0.0	
MAY													
KWH	24888.	0.	35290.	585.	13354.	0.	1409.	20118.	0.	7.	140419.	0.	236071.
MAX KW	79.079	0.000	108.785	19.847	60.497	0.000	2.190	47.176	0.000	1.841	455.905	0.000	679.973
DAY/HR	1/21	0/ 0	5/ 9	2/ 6	29/17	0/ 0	1/ 2	29/17	0/ 0	2/ 5	5/ 9	0/ 0	30/ 8
PEAK ENDUSE	43.943	0.000	108.444	0.000	33.102	0.000	1.268	37.395	0.000	0.000	455.822	0.000	
PEAK PCT	6.5	0.0	15.9	0.0	4.9	0.0	0.2	5.5	0.0	0.0	67.0	0.0	
JUN													
KWH	24032.	0.	34155.	11.	19038.	0.	1129.	21718.	0.	0.	135849.	0.	235932.
MAX KW	79.079	0.000	108.785	0.720	74.760	0.000	2.190	49.206	0.000	0.000	455.897	0.000	686.830
DAY/HR	1/21	0/ 0	2/ 9	28/ 5	11/18	0/ 0	1/ 2	11/16	0/ 0	0/ 0	2/ 9	0/ 0	11/ 8
PEAK ENDUSE	43.943	0.000	108.444	0.000	38.801	0.000	0.190	39.639	0.000	0.000	455.814	0.000	
PEAK PCT	6.4	0.0	15.8	0.0	5.6	0.0	0.0	5.8	0.0	0.0	66.4	0.0	
JUL													
KWH	24686.	0.	35303.	0.	24297.	0.	843.	24025.	0.	0.	140291.	0.	249444.
MAX KW	79.079	0.000	108.785	0.000	80.790	0.000	2.190	51.653	0.000	0.000	455.888	0.000	699.640
DAY/HR	2/21	0/ 0	1/ 9	0/ 0	20/16	0/ 0	1/24	20/17	0/ 0	0/ 0	1/ 9	0/ 0	20/ 8
PEAK ENDUSE	43.943	0.000	108.444	0.000	48.621	0.000	2.190	40.639	0.000	0.000	455.803	0.000	
PEAK PCT	6.3	0.0	15.5	0.0	6.9	0.0	0.3	5.8	0.0	0.0	65.1	0.0	
AUG													
KWH	25091.	0.	35277.	3.	22080.	0.	915.	23491.	0.	0.	140513.	0.	247368.
MAX KW	79.079	0.000	108.785	0.396	70.780	0.000	2.190	50.184	0.000	0.000	455.877	0.000	691.501
DAY/HR	1/21	0/ 0	4/ 9	5/ 6	22/17	0/ 0	1/ 2	22/17	0/ 0	0/ 0	4/ 9	0/ 0	26/ 9
PEAK ENDUSE	29.878	0.000	108.785	0.000	52.587	0.000	2.190	42.187	0.000	0.000	455.874	0.000	
PEAK PCT	4.3	0.0	15.7	0.0	7.6	0.0	0.3	6.1	0.0	0.0	65.9	0.0	

SEP													
KWH	23627.	0.	34182.	71.	16025.	0.	1144.	20554.	0.	0.	135608.	0.	231210.
MAX KW	79.079	0.000	108.785	8.829	75.916	0.000	2.190	51.285	0.000	0.000	455.874	0.000	668.603
DAY/HR	4/21	0/ 0	1/ 9	29/ 7	14/16	0/ 0	1/ 2	14/16	0/ 0	0/ 0	1/ 9	0/ 0	14/ 8
PEAK ENDUSE	43.943	0.000	108.444	0.000	26.013	0.000	2.002	32.406	0.000	0.000	455.795	0.000	
PEAK PCT	6.6	0.0	16.2	0.0	3.9	0.0	0.3	4.8	0.0	0.0	68.2	0.0	
OCT													
KWH	24888.	0.	35290.	1731.	9843.	0.	1554.	18855.	0.	7.	140400.	0.	232568.
MAX KW	79.079	0.000	108.785	24.853	40.602	0.000	2.190	41.460	0.000	1.881	455.877	0.000	655.710
DAY/HR	1/21	0/ 0	6/ 9	13/ 7	6/15	0/ 0	1/ 2	18/16	0/ 0	30/ 5	28/ 9	0/ 0	3/ 8
PEAK ENDUSE	43.943	0.000	108.444	0.000	19.223	0.000	2.190	26.114	0.000	0.000	455.796	0.000	
PEAK PCT	6.7	0.0	16.5	0.0	2.9	0.0	0.3	4.0	0.0	0.0	69.5	0.0	
NOV													
KWH	23834.	0.	34169.	4097.	4943.	0.	1566.	17730.	0.	64.	135730.	0.	222133.
MAX KW	79.079	0.000	108.785	30.921	24.421	0.000	2.190	35.759	0.000	3.340	455.885	0.000	660.243
DAY/HR	1/21	0/ 0	3/ 9	25/ 7	1/15	0/ 0	1/ 2	1/15	0/ 0	25/ 7	25/ 9	0/ 0	29/ 8
PEAK ENDUSE	43.943	0.000	108.444	18.456	6.630	0.000	2.190	24.772	0.000	0.000	455.807	0.000	
PEAK PCT	6.7	0.0	16.4	2.8	1.0	0.0	0.3	3.8	0.0	0.0	69.0	0.0	
DEC													
KWH	24492.	0.	35316.	3084.	4323.	0.	1628.	19537.	0.	65.	140185.	0.	228630.
MAX KW	79.079	0.000	108.785	33.586	20.688	0.000	2.190	37.266	0.000	3.265	455.896	0.000	669.968
DAY/HR	3/21	0/ 0	1/ 9	27/ 7	11/13	0/ 0	1/ 1	24/14	0/ 0	27/ 7	30/ 9	0/ 0	14/ 8
PEAK ENDUSE	43.943	0.000	108.444	25.220	6.531	0.000	2.190	25.627	0.000	2.197	455.815	0.000	
PEAK PCT	6.6	0.0	16.2	3.8	1.0	0.0	0.3	3.8	0.0	0.3	68.0	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
KWH	291447.	0.	415617.	15561.	134566.	0.	16470.	240942.	0.	275.	1652322.	0.	2767200.
MAX KW	79.079	0.000	108.785	33.586	80.790	0.000	2.190	51.653	0.000	3.340	455.912	0.000	699.640
MON/DY	1/ 2	0/ 0	1/ 1	12/27	7/20	0/ 0	1/ 1	7/20	0/ 0	11/25	3/25	0/ 0	7/20
PEAK ENDUSE	43.943	0.000	108.444	0.000	48.621	0.000	2.190	40.639	0.000	0.000	455.803	0.000	
PEAK PCT	6.3	0.0	15.5	0.0	6.9	0.0	0.3	5.8	0.0	0.0	65.1	0.0	

YEARLY TRANSFORMER LOSSES = 0.0 KWH

REPORT- PS-F Energy End-Use Summary for FM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
FEB													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAR													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
APR													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAY													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUN													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUL													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AUG													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

SEP													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
OCT													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NOV													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
DEC													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MON/DY	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

REPORT- PS-F Energy End-Use Summary for Hotel Fuel Meter WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
THERM	0.	0.	0.	2564.	0.	0.	0.	0.	0.	0.	0.	0.	2564.
MAX THERM/HR	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0
DAY/HR	0/ 0	0/ 0	0/ 0	31/ 9	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	31/ 9
PEAK ENDUSE	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
FEB													
THERM	0.	0.	0.	2195.	0.	0.	0.	0.	0.	0.	0.	0.	2195.
MAX THERM/HR	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3
DAY/HR	0/ 0	0/ 0	0/ 0	17/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	17/ 7
PEAK ENDUSE	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAR													
THERM	0.	0.	0.	2070.	0.	0.	0.	0.	0.	0.	0.	0.	2070.
MAX THERM/HR	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8
DAY/HR	0/ 0	0/ 0	0/ 0	18/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	18/ 7
PEAK ENDUSE	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
APR													
THERM	0.	0.	0.	1447.	0.	0.	0.	0.	0.	0.	0.	0.	1447.
MAX THERM/HR	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 7
PEAK ENDUSE	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MAY													
THERM	0.	0.	0.	634.	0.	0.	0.	0.	0.	0.	0.	0.	634.
MAX THERM/HR	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
DAY/HR	0/ 0	0/ 0	0/ 0	1/ 6	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 6
PEAK ENDUSE	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUN													
THERM	0.	0.	0.	234.	0.	0.	0.	0.	0.	0.	0.	0.	234.
MAX THERM/HR	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
DAY/HR	0/ 0	0/ 0	0/ 0	14/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	14/ 5
PEAK ENDUSE	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
JUL													
THERM	0.	0.	0.	29.	0.	0.	0.	0.	0.	0.	0.	0.	29.
MAX THERM/HR	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 3	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 3
PEAK ENDUSE	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AUG													
THERM	0.	0.	0.	72.	0.	0.	0.	0.	0.	0.	0.	0.	72.
MAX THERM/HR	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 6	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 6
PEAK ENDUSE	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

SEP													
THERM	0.	0.	0.	269.	0.	0.	0.	0.	0.	0.	0.	0.	269.
MAX THERM/HR	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9
DAY/HR	0/ 0	0/ 0	0/ 0	29/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	29/ 7
PEAK ENDUSE	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
OCT													
THERM	0.	0.	0.	895.	0.	0.	0.	0.	0.	0.	0.	0.	895.
MAX THERM/HR	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7
DAY/HR	0/ 0	0/ 0	0/ 0	27/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	27/ 7
PEAK ENDUSE	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NOV													
THERM	0.	0.	0.	1649.	0.	0.	0.	0.	0.	0.	0.	0.	1649.
MAX THERM/HR	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5
DAY/HR	0/ 0	0/ 0	0/ 0	14/ 6	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	14/ 6
PEAK ENDUSE	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
DEC													
THERM	0.	0.	0.	2254.	0.	0.	0.	0.	0.	0.	0.	0.	2254.
MAX THERM/HR	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9
DAY/HR	0/ 0	0/ 0	0/ 0	24/ 9	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	24/ 9
PEAK ENDUSE	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	=======	========
THERM	0.	0.	0.	14311.	0.	0.	0.	0.	0.	0.	0.	0.	14311.
MAX THERM/HR	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9
MON/DY	0/ 0	0/ 0	0/ 0	12/24	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	12/24
PEAK ENDUSE	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

E.6 Solar Study

ELECTRIFICATION STUDY

Union Square

May, 2019

Rooftop Solar Summary

	PV PRODUCTIVITY ANALYSIS[1]							FEIR COMMITMENT		
Lot	Potential Roof Area (SF)	Studied Roof Area (SF)	Potential kW DC	Potential kWh	Cost per Watt ($)	Project Cost ($)	Simple Payback	PV Set Aside (SF)	Potential Additional Set-Aside (SF)[2]	Note
1.1	6,849	6,849	79.2	89,296	2.68	212,000	8 yrs	6,700		*shading fram 1.2 am and pm, fram 2.1 in winter*
1.2	17,237	17,237	185.6	198,134	2.25	418,000	7 yrs		16,600	*gaad expasure*
2.1	-		-		-	-				*planned as lab, na available raaf area*
2.2	14,066	10,626	115.4	119,203	2.41	278,000	8 yrs	10,200		*shading fram 2.3, mid am ta mid pm*
2.3	-		-		-	-				*mechanicals at tawer raaf, na available raaf area*
3.1	15,352	15,352	185.6	198,134	2.25	418,000	7 yrs		14,800	*salar an sauth east and west, shading fram 3.2*
3.2	7,946		-	-	-	-				*taa much shading with limited array areas*
3.3	18,332	18,332	214.1	237,191	2.25	482,000	6 yrs		17,700	*shading fram 3.2 in PM*
4.1	2,962	2,962	33.9	38,684	3.49	118,000	11 yrs	2,800		*shaded by 2.3, small area with extensive payback*
4.2	-	-	-	-	-	-				*na salar, taa small*
4.3	9,897	7,112	93.6	113,537	2.61	244,000	7 yrs	6,800		*gaad expasure and praductivity*
5.2	2,862	2,084	26.5	29,302	3.76	100,000	9 yrs	2,000		*small with shading fram 1.1 and 1.2, highest cast/watt*
5.3	3,986		-		-	-				*unpraductive, significant shading fram 1.1 and 1.2*
6.1	4,487		-		-	-				*limited available area per zaning heigh sensitivities*
6.2	4,393		-		-	-				*limited available area per zaning heigh sensitivities*
7.1	6,680	4,317	60.8	68,123	2.86	174,000	8 yrs	4,100		*shading fram 7.2 in am*
7.2	9,237	7,738	95.2	114,497	2.60	248,000	7 yrs	7,400		*gaad expasure and praductivity*
Total	**124,286**	**92,609**	**1,090**	**1,206,101**		**2,692,000**		**40,000**	**49,100**	
kWh/SF				*13.02*						

Avg. Paybacl	8 yrs	
Maximum Potential Set Aside (SF)	**89,100**	*sum af PV Set-aside and Patential Additianal Set-Aside*
Imputed Praductivity (kWh)	1,160,401	*Maximum Patential Set Aside * 13.02kWh*
Imputed Cost	2,589,999	

[1]Analysis by solect energy provided on following pages

[2]Additional PV set-aside available in event buildings are delivered as office buildings. If lab, limited productive roof area would remain available.

Solar Project Financial Pro Forma: Union Square 1.1

Capital Purchase w/ MA SMART Incentives

solectenergy
Smart Solar, Smart Business.

4/23/2019 PRELIMINARY ESTIMATE

Project Details

System Nameplate Capacity (DC)	79.2 kW	
Annual Electric Production (AC)	89,296 kWh	
Project Cost	$211,793	$2.68 per watt cost
Federal Tax Credit	(63,538)	-30%
After Credit System Cost	$148,255	
Financing	$0	0%
Down Payment	$211,793	100%
Internal Rate of Return	10.1%	
Levelized Cost of Electricity	($0.077)	per kWh
Net Present Value	$48,048	(at 6% discount rate)

Assumptions	
Loan Term (yrs)	N/A
Electricity Rate	$0.123
Electricity Rate Adjustor	3.0%
Income Tax Rate	27%
Asset Valuation Cap Rate	10%
SMART Tariff	$0.2640
Metering	Stand-Alone
Block	2 - Eversource

Income Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 6	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 18	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Electricity Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MA SMART Revenue	$23,574	$23,444	$23,316	$23,187	$23,060	$22,933	$22,807	$22,681	$22,557	$22,433	$22,309	$22,186	$22,064	$21,943	$21,822	$21,702	$21,583	$21,464	$21,346	$21,229	$447,641
REC Revenues	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ESS Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue + Avoided Cost	$23,574	$23,444	$23,316	$23,167	$23,060	$22,933	$22,607	$22,681	$22,557	$22,433	$22,309	$22,186	$22,064	$21,943	$21,822	$21,702	$21,583	$21,464	$21,346	$21,229	$447,641
Insurance	($635)	($616)	($598)	($580)	($562)	($546)	($529)	($513)	($498)	($483)	($469)	($454)	($441)	($428)	($415)	($402)	($390)	($379)	($367)	($356)	($9,662)
Property Tax (PV PILOT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Maintenance & Operating Costs	$0	($2,223)	($2,279)	($2,336)	($2,394)	($2,454)	($2,515)	($2,578)	($2,642)	($2,709)	($3,297)	($3,367)	($3,438)	($3,511)	($3,586)	($3,141)	($3,220)	($3,300)	($3,383)	($3,467)	($55,838)
Federal Depreciation Expense	($180,024)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($180,024)
Interest Expense - Bank	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	($180,659)	($2,839)	($2,876)	($2,915)	($2,956)	($2,999)	($3,044)	($3,091)	($3,140)	($3,192)	($3,766)	($3,821)	($3,879)	($3,939)	($4,000)	($3,543)	($3,610)	($3,679)	($3,750)	($3,623)	($245,524)
Net Income	($157,085)	$20,605	$20,439	$20,272	$20,103	$19,933	$19,762	$19,590	$19,416	$19,241	$18,543	$18,365	$18,186	$18,005	$17,822	$18,159	$17,973	$17,786	$17,596	$17,405	$202,117
Loss Carryforward	($157,085)	($136,480)	($116,041)	($95,769)	($75,666)	($55,732)	($35,970)	($16,380)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	$0	($820)	($5,195)	($5,007)	($4,959)	($4,910)	($4,861)	($4,812)	($4,903)	($4,853)	($4,802)	($4,751)	($4,699)	($54,572)

Note: Assumes depreciation is used as a 'Loss Carry Forward' to offset SREC Income.
If depreciation is able to be fully used immediately, in first year it's value would be: $48,606

Cash Flow Statement																					
Avoided Cost + Revenue	$23,574	$23,444	$23,316	$23,187	$23,060	$22,933	$22,807	$22,681	$22,557	$22,433	$22,309	$22,186	$22,064	$21,943	$21,822	$21,702	$21,583	$21,464	$21,346	$21,229	$447,641
Operating Expenses	($635)	($2,839)	($2,876)	($2,915)	($2,956)	($2,999)	($3,044)	($3,091)	($3,140)	($3,192)	($3,766)	($3,821)	($3,879)	($3,939)	($4,000)	($3,543)	($3,610)	($3,679)	($3,750)	($3,823)	($65,501)
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow Before Taxes	$22,939	$20,605	$20,439	$20,272	$20,103	$19,933	$19,762	$19,590	$19,416	$19,241	$18,543	$18,365	$18,186	$18,005	$17,822	$18,159	$17,973	$17,786	$17,598	$17,405	$382,141
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	$0	($820)	($5,195)	($5,007)	($4,959)	($4,910)	($4,861)	($4,612)	($4,903)	($4,853)	($4,802)	($4,751)	($4,699)	($54,572)
Net Cash Flow	$22,939	$20,605	$20,439	$20,272	$20,103	$19,933	$19,762	$19,590	$18,596	$14,046	$13,537	$13,407	$13,275	$13,143	$13,010	$13,256	$13,120	$12,964	$12,645	$12,706	$327,569
Federal Tax Credit	$63,538	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$63,536
Cumulative Net Cash Flow	($125,316)	($104,711)	($84,272)	($64,000)	($43,697)	($23,963)	($4,201)	$15,389	$33,985	$48,031	$61,568	$74,974	$88,250	$101,393	$114,403	$127,659	$140,779	$153,763	$166,606	$179,314	
Asset Valuation (at end of YR)	$145,645	$142,751	$139,677	$136,399	$132,886	$129,102	$125,001	$120,529	$115,615	$110,174	$104,464	$98,023	$90,669	$82,155	$72,134	$59,525	$44,012	$24,350	($1,531)	($37,360)	

Notes:
1) Disclaimer: This solar model is for informational purposes only and no data contained in this solar model constitutes tax, legal, insurance or investment advice. The financial inputs throughout this solar model, whether electricity quotes, rebates, tax, or any other statement or statements regarding financial information, is obtained from sources which we believe reliable, but we do not warrant or guarantee the timeliness or accuracy of this information.
2) Qualification for the state incentive program are assumptions and timing dependent.
3) Net metering rate (if relevant) dependant upon timing of Application for Cap Allocation (ACA) qualification.
4) Inverter(s) may need to be replaced during system life - model assumes at end of year 15
5) Asset Valuation based on a sliding value of future electric + incentive/REC revenues net of operating expenses and a cap rate of 10%
6) REC values are assumed to be $0. / kWh

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Solar Photovoltaic System Project

Union Square 1.1

PRELIMINARY ESTIMATE

Financial Summary - Capital Purchase

System Size	79 kW	$2.68 per watt cost	($211,793)
Financing (0%)			$0
Net Systems Cost			**($211,793)**

Year 1 Details

30% Investment Tax Credit (utilized over 1 year(s))	$63,538
Year 1 Electricity Cost Avoidance	$0
Year 1 State Incentives	$23,574
Gross Revenue	**$87,112**
Year 1 Estimated Insurance & Maintenance Cost	($635)
Debt Service	$0
Net Revenue	**$86,477**

Financial Analysis

Year	Cash Flow	Cummulative
0	($211,793)	($211,793)
1	$86,477	($125,316)
2	$20,605	($104,711)
3	$20,439	($84,272)
4	$20,272	($64,000)
5	$20,103	($43,897)
6	$19,762	($24,135)
7	$19,933	($4,201)
8	$19,590	$15,389
9	$18,596	$33,985
10	$14,046	$48,031
11	$13,537	$61,568
12	$13,407	$74,974
13	$13,275	$88,250
14	$13,010	$101,260
15	$13,256	$114,516
	$72,134	

Cash Flow Positive	**Year 8**	
Internal Rate of Return	**10%**	
Net Present Value (NPV) @ 8% discount	**$24,910**	
Asset Valuation after Year 15	**$72,134**	
Year 1 Solar Electric Production	**89,296**	kWh per year AC

Notes:

1) Cash Flow assumes 27% federal tax rate and that depreciation only offsets income taxes from incentive revenue.
2) Asset Valuation based on a cap rate of 10%
3) Systems are modelled as "stand alone" under SMART vs. behind the meter

Solar Project Financial Pro Forma: Union Square 1.2

Capital Purchase w/ MA SMART Incentives

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4/23/2019 PRELIMINARY ESTIMATE

Project Details

System Nameplate Capacity (DC)	185.6 kW	
Annual Electric Production (AC)	198,134 kWh	
Project Cost	$418,326	$2.25 per watt cost
Federal Tax Credit	(125,498)	-30%
After Credit System Cost	$292,828	
Financing	$0	0%
Down Payment	$418,326	100%
Internal Rate of Return	12.3%	
Levelized Cost of Electricity	($0.089) per kWh	
Net Present Value	$144,464 (at 6% discount rate)	

Assumptions	
Loan Term (yrs)	N/A
Electricity Rate	$0.123
Electricity Rate Adjustor	3.0%
Income Tax Rate	27%
Asset Valuation Cap Rate	10%
SMART Tariff	$0.2640
Metering	Stand-Alone
Block	2 - Eversource

Income Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Electricity Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MA SMART Revenue	$52,307	$52,020	$51,733	$51,449	$51,166	$50,885	$50,605	$50,326	$50,050	$49,774	$49,501	$49,228	$48,958	$48,688	$48,420	$48,154	$47,889	$47,626	$47,364	$47,103	$993,247
REC Revenues	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ESS Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue + Avoided Cost	$52,307	$52,020	$51,733	$51,449	$51,166	$50,885	$50,605	$50,326	$50,050	$49,774	$49,501	$49,228	$48,958	$48,688	$48,420	$48,154	$47,889	$47,626	$47,364	$47,103	$993,247
Insurance	($1,255)	($1,217)	($1,181)	($1,145)	($1,111)	($1,078)	($1,045)	($1,014)	($984)	($954)	($925)	($898)	($871)	($845)	($819)	($795)	($771)	($748)	($725)	($704)	($19,084)
Property Tax (PV PILOT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Maintenance & Operating Costs	$0	($3,502)	($3,590)	($3,680)	($3,772)	($3,866)	($3,963)	($4,062)	($4,163)	($4,267)	($5,417)	($5,526)	($5,638)	($5,753)	($5,871)	($4,949)	($5,073)	($5,199)	($5,329)	($5,463)	($89,082)
Federal Depreciation Expense	($355,577)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($355,577)
Interest Expense - Bank	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	($356,832)	($4,720)	($4,771)	($4,825)	($4,883)	($4,944)	($5,008)	($5,076)	($5,147)	($5,221)	($6,342)	($6,424)	($6,509)	($6,597)	($6,690)	($5,744)	($5,843)	($5,947)	($8,055)	($6,166)	($463,743)
Net Income	($304,524)	$47,300	$46,963	$46,624	$46,283	$45,941	$45,597	$45,251	$44,903	$44,553	$43,159	$42,805	$42,449	$42,091	$41,731	$42,411	$42,046	$41,679	$41,309	$40,937	$529,503
Loss Carryforward	($304,524)	($257,225)	($210,262)	($163,638)	($117,355)	($71,414)	($25,818)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	($5,247)	($12,124)	($12,029)	($11,653)	($11,557)	($11,461)	($11,365)	($11,267)	($11,451)	($11,352)	($11,253)	($11,153)	($11,053)	($142,966)

Note: Assumes depreciation is used as a 'Loss Carry Forward' to offset SREC Income.
If depreciation is able to be fully used immediately, in first year it's value would be: $96,006

Cash Flow Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Avoided Cost + Revenue	$52,307	$52,020	$51,733	$51,449	$51,166	$50,885	$50,605	$50,326	$50,050	$49,774	$49,501	$49,228	$48,958	$48,688	$48,420	$48,154	$47,889	$47,626	$47,364	$47,103	$993,247
Operating Expenses	($1,255)	($4,720)	($4,771)	($4,825)	($4,883)	($4,944)	($5,008)	($5,076)	($5,147)	($5,221)	($6,342)	($6,424)	($6,509)	($6,597)	($6,690)	($5,744)	($5,843)	($5,947)	($6,055)	($6,166)	($108,166)
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow Before Taxes	$51,052	$47,300	$46,963	$46,624	$46,283	$45,941	$45,597	$45,251	$44,903	$44,553	$43,159	$42,805	$42,449	$42,091	$41,731	$42,411	$42,046	$41,679	$41,309	$40,937	$885,080
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	($5,247)	($12,124)	($12,029)	($11,653)	($11,557)	($11,461)	($11,365)	($11,267)	($11,451)	($11,352)	($11,253)	($11,153)	($11,053)	($142,966)
Net Cash Flow	$51,052	$47,300	$46,963	$46,624	$46,283	$45,941	$45,597	$40,004	$32,779	$32,524	$31,506	$31,247	$30,988	$30,726	$30,463	$30,960	$30,693	$30,425	$30,156	$29,884	$742,114
Federal Tax Credit	$125,498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$125,498
Cumulative Net Cash Flow	($241,776)	($194,476)	($147,513)	($100,889)	($54,606)	($8,665)	$36,931	$76,935	$109,714	$142,237	$173,743	$204,991	$235,978	$266,704	$297,168	$328,127	$358,821	$389,246	$419,402	$449,286	
Asset Valuation (at end of YR)	$342,677	$336,482	$329,893	$322,855	$315,301	$307,149	$298,301	$288,633	$277,994	$266,189	$253,714	$239,613	$223,481	$204,766	$182,693	$154,986	$120,838	$77,492	$20,349	($58,863)	

Notes:
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2) Qualification for the state incentive program are assumptions and timing dependent.
3) Net metering rate (if relevent) dependent upon timing of Application for Cap Allocation (ACA) qualification.
4) Inverter(s) may need to be replaced during system life - model assumes at end of year 15
5) Asset Valuation based on a sliding value of future electric + incentive/REC revenues net of operating expenses and a cap rate of 10%
6) REC values are assumed to be $0. / kWh

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Union Square 1.2

PRELIMINARY ESTIMATE

Financial Summary - Capital Purchase

System Size	186 kW	$2.25 per watt cost	($418,326)
Financing (0%)			$0
Net Systems Cost			**($418,326)**

Year 1 Details

30% Investment Tax Credit (utilized over 1 year(s))	$125,498
Year 1 Electricity Cost Avoidance	$0
Year 1 State Incentives	$52,307
Gross Revenue	**$177,805**
Year 1 Estimated Insurance & Maintenance Cost	($1,255)
Debt Service	$0
Net Revenue	**$176,550**

Financial Analysis

Year	Cash Flow	Cummulative
0	($418,326)	($418,326)
1	$176,550	($241,776)
2	$47,300	($194,476)
3	$46,963	($147,513)
4	$46,624	($100,889)
5	$46,283	($54,606)
6	$45,597	($9,010)
7	$45,941	$36,931
8	$40,004	$76,935
9	$32,779	$109,714
10	$32,524	$142,237
11	$31,506	$173,743
12	$31,247	$204,991
13	$30,988	$235,978
14	$30,463	$266,441
15	$30,960	$297,401
	$182,693	

Cash Flow Positive	**Year 7**	
Internal Rate of Return	**13%**	
Net Present Value (NPV) @ 8% discount	**$100,126**	
Asset Valuation after Year 15	**$182,693**	
Year 1 Solar Electric Production	**198,134**	kWh per year AC

Notes:

1) Cash Flow assumes 27% federal tax rate and that depreciation only offsets income taxes from incentive revenue.
2) Asset Valuation based on a cap rate of 10%
3) Systems are modelled as "stand alone" under SMART vs. behind the meter

Solar Project Financial Pro Forma: Union Square 2.2

4/23/2019 PRELIMINARY ESTIMATE

Capital Purchase w/ MA SMART Incentives

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Project Details

System Nameplate Capacity (DC)	115.4 kW	
Annual Electric Production (AC)	119,203 kWh	
Project Cost	$278,483	$2.41 per watt cost
Federal Tax Credit	($83,545)	-30%
After Credit System Cost	$194,938	
Financing	$0	0%
Down Payment	$278,483	100%
Internal Rate of Return	10.4%	
Levelized Cost of Electricity	($0.079) per kWh	
Net Present Value	$66,070 (at 6% discount rate)	

Assumptions	
Loan Term (yrs)	N/A
Electricity Rate	$0.123
Electricity Rate Adjustor	3.0%
Income Tax Rate	27%
Asset Valuation Cap Rate	10%
SMART Tariff	$0.2640
Metering	Stand-Alone
Block	2 - Eversource

Income Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Electricity Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MA SMART Revenue	$31,470	$31,297	$31,124	$30,953	$30,783	$30,614	$30,445	$30,278	$30,111	$29,946	$29,781	$29,617	$29,454	$29,292	$29,131	$28,971	$28,812	$28,653	$28,496	$28,339	$597,568
REC Revenues	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ESS Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue + Avoided Cost	$31,470	$31,297	$31,124	$30,953	$30,783	$30,614	$30,445	$30,278	$30,111	$29,946	$29,781	$29,617	$29,454	$29,292	$29,131	$28,971	$28,812	$28,653	$28,496	$28,339	$597,568
Insurance	($835)	($810)	($786)	($762)	($740)	($717)	($696)	($675)	($655)	($635)	($616)	($598)	($580)	($562)	($545)	($529)	($513)	($498)	($483)	($468)	($12,705)
Property Tax (PV PILOT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Maintenance & Operating Costs	$0	($2,725)	($2,793)	($2,863)	($2,934)	($3,008)	($3,083)	($3,160)	($3,239)	($3,320)	($4,105)	($4,190)	($4,277)	($4,367)	($4,458)	($3,850)	($3,946)	($4,045)	($4,146)	($4,250)	($68,760)
Federal Depreciation Expense	($236,711)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($236,711)
Interest Expense - Bank	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	($237,546)	($3,535)	($3,579)	($3,625)	($3,674)	($3,725)	($3,779)	($3,835)	($3,894)	($3,955)	($4,721)	($4,788)	($4,857)	($4,929)	($5,004)	($4,379)	($4,460)	($4,543)	($4,629)	($4,718)	($318,176)
Net Income	($206,077)	$27,761	$27,545	$27,328	$27,109	$26,889	$26,666	$26,443	$26,218	$25,991	$25,060	$24,830	$24,597	$24,364	$24,128	$24,592	$24,352	$24,110	$23,867	$23,821	$279,393
Loss Carryforward	($206,077)	($178,315)	($150,770)	($123,442)	($96,333)	($69,445)	($42,778)	($16,335)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	$0	($2,668)	($7,017)	($6,766)	($6,704)	($6,641)	($6,578)	($6,514)	($6,640)	($6,575)	($8,510)	($6,444)	($6,378)	($75,436)

Note: Assumes depreciation is used as a 'Loss Carry Forward' to offset SREC Income.
If depreciation is able to be fully used immediately, in first year it's value would be: $63,912

Cash Flow Statement																					
Avoided Cost + Revenue	$31,470	$31,297	$31,124	$30,953	$30,783	$30,614	$30,445	$30,278	$30,111	$29,946	$29,781	$29,617	$29,454	$29,292	$29,131	$28,971	$28,812	$28,653	$28,496	$28,339	$597,568
Operating Expenses	($835)	($3,535)	($3,579)	($3,625)	($3,674)	($3,725)	($3,779)	($3,835)	($3,894)	($3,955)	($4,721)	($4,788)	($4,857)	($4,929)	($5,004)	($4,379)	($4,460)	($4,543)	($4,629)	($4,718)	($81,465)
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow Before Taxes	$30,634	$27,761	$27,545	$27,328	$27,109	$26,889	$26,666	$26,443	$26,218	$25,991	$25,060	$24,830	$24,597	$24,364	$24,128	$24,592	$24,352	$24,110	$23,867	$23,821	$518,104
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	$0	($2,668)	($7,017)	($6,766)	($6,704)	($6,641)	($6,578)	($6,514)	($6,640)	($6,575)	($6,510)	($6,444)	($6,378)	($75,436)
Net Cash Flow	$30,634	$27,761	$27,545	$27,328	$27,109	$26,889	$26,666	$26,443	$23,549	$18,973	$18,294	$18,126	$17,956	$17,785	$17,613	$17,952	$17,777	$17,601	$17,423	$17,243	$440,668
Federal Tax Credit	$83,545	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$83,545
Cumulative Net Cash Flow	($164,304)	($136,543)	($108,997)	($81,670)	($54,561)	($27,672)	($1,006)	$25,437	$48,987	$67,960	$86,254	$104,379	$122,335	$140,121	$157,734	$175,686	$193,463	$211,063	$228,486	$245,729	
Asset Valuation (at end of YR)	$197,684	$193,856	$189,790	$185,451	$180,799	$175,786	$170,350	$164,419	$157,900	$150,678	$143,099	$134,547	$124,778	$113,462	$100,135	$83,349	$62,686	$36,487	$1,986	($45,795)	

Notes:
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2) Qualification for the state incentive program are assumptions and timing dependent.
3) Net metering rate (if relevant) dependant upon timing of Application for Cap Allocation (ACA) qualification.
4) Inverter(s) may need to be replaced during system life - model assumes at end of year 15
5) Asset Valuation based on a sliding value of future electric + incentive/REC revenues net of operating expenses and a cap rate of 10%
6) REC values are assumed to be $0. / kWh

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Solar Photovoltaic System Project
Union Square 2.2

Financial Summary - Capital Purchase

System Size	115 kW	$2.41 per watt cost	($278,483)
Financing (0%)			$0
Net Systems Cost			**($278,483)**

Year 1 Details

30% Investment Tax Credit (utilized over 1 year(s))	$83,545
Year 1 Electricity Cost Avoidance	$0
Year 1 State Incentives	$31,470
Gross Revenue	**$115,015**
Year 1 Estimated Insurance & Maintenance Cost	($835)
Debt Service	$0
Net Revenue	**$114,179**

Financial Analysis

Year	Cash Flow	Cummulative
0	($278,483)	($278,483)
1	$114,179	($164,304)
2	$27,761	($136,543)
3	$27,545	($108,997)
4	$27,328	($81,670)
5	$27,109	($54,561)
6	$26,666	($27,894)
7	$26,889	($1,006)
8	$26,443	$25,437
9	$23,549	$48,987
10	$18,973	$67,960
11	$18,294	$86,254
12	$18,126	$104,379
13	$17,956	$122,335
14	$17,613	$139,949
15	$17,952	$157,901
	$100,135	

Cash Flow Positive	**Year 8**	
Internal Rate of Return	**11%**	
Net Present Value (NPV) @ 8% discount	**$38,261**	
Asset Valuation after Year 15	**$100,135**	
Year 1 Solar Electric Production	**119,203**	kWh per year AC

Notes:

1) Cash Flow assumes 27% federal tax rate and that depreciation only offsets income taxes from incentive revenue.
2) Asset Valuation based on a cap rate of 10%
3) Systems are modelled as "stand alone" under SMART vs. behind the meter

Solar Project Financial Pro Forma: Union Square 3.1

4/23/2019 PRELIMINARY ESTIMATE

Capital Purchase w/ MA SMART Incentives

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Project Details

System Nameplate Capacity (DC)	185.6	kW	
Annual Electric Production (AC)	198,134	kWh	
Project Cost	$418,326		$2.25 per watt cost
Federal Tax Credit	(125,498)		-30%
After Credit System Cost	$292,828		
Financing	$0		0%
Down Payment	$418,326		100%
Internal Rate of Return	12.3%		
Levelized Cost of Electricity	($0.089)	per kWh	
Net Present Value	$144,464	(at 6% discount rate)	

Assumptions	
Loan Term (yrs)	N/A
Electricity Rate	$0.123
Electricity Rate Adjustor	3.0%
Income Tax Rate	27%
Asset Valuation Cap Rate	10%
SMART Tariff	$0.2640
Metering	Stand-Alone
Block	2 - Eversource

Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Electricity Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MA SMART Revenue	$52,307	$52,020	$51,733	$51,449	$51,166	$50,885	$50,605	$50,326	$50,050	$49,774	$49,501	$49,228	$48,958	$48,688	$48,420	$48,154	$47,889	$47,626	$47,364	$47,103	$993,247
REC Revenues	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ESS Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue + Avoided Cost	$52,307	$52,020	$51,733	$51,449	$51,166	$50,885	$50,605	$50,326	$50,050	$49,774	$49,501	$49,228	$48,958	$48,688	$48,420	$48,154	$47,889	$47,626	$47,364	$47,103	$993,247
Insurance	($1,255)	($1,217)	($1,181)	($1,145)	($1,111)	($1,078)	($1,045)	($1,014)	($984)	($954)	($925)	($898)	($871)	($845)	($819)	($795)	($771)	($748)	($725)	($704)	($19,084)
Property Tax (PV PILOT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Maintenance & Operating Costs	$0	($3,502)	($3,590)	($3,680)	($3,772)	($3,866)	($3,963)	($4,062)	($4,163)	($4,267)	($5,417)	($5,526)	($5,638)	($5,753)	($5,871)	($4,949)	($5,073)	($5,199)	($5,329)	($5,463)	($89,082)
Federal Depreciation Expense	($355,577)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($355,577)
Interest Expense - Bank	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	($356,832)	($4,720)	($4,771)	($4,825)	($4,883)	($4,944)	($5,008)	($5,076)	($5,147)	($5,221)	($6,342)	($6,424)	($6,509)	($6,597)	($6,690)	($5,744)	($5,843)	($5,947)	($8,055)	($6,166)	($463,743)
Net Income	($304,524)	$47,300	$46,963	$46,624	$46,283	$45,941	$45,597	$45,251	$44,903	$44,553	$43,159	$42,805	$42,449	$42,091	$41,731	$42,411	$42,046	$41,679	$41,309	$40,937	$529,503
Loss Carryforward	($304,524)	($257,225)	($210,262)	($163,638)	($117,355)	($71,414)	($25,818)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	($5,247)	($12,124)	($12,029)	($11,653)	($11,557)	($11,461)	($11,365)	($11,267)	($11,451)	($11,352)	($11,253)	($11,153)	($11,053)	($142,968)

Note: Assumes depreciation is used as a 'Loss Carry Forward' to offset SREC income.
If depreciation is able to be fully used immediately, in first year it's value would be: $96,006

Cash Flow Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Avoided Cost + Revenue	$52,307	$52,020	$51,733	$51,449	$51,166	$50,885	$50,605	$50,326	$50,050	$49,774	$49,501	$49,228	$48,958	$48,688	$48,420	$48,154	$47,889	$47,626	$47,364	$47,103	$993,247
Operating Expenses	($1,255)	($4,720)	($4,771)	($4,825)	($4,883)	($4,944)	($5,008)	($5,076)	($5,147)	($5,221)	($6,342)	($6,424)	($6,509)	($6,597)	($6,690)	($5,744)	($5,843)	($5,947)	($6,055)	($6,166)	($108,166)
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow Before Taxes	$51,052	$47,300	$46,963	$46,624	$46,283	$45,941	$45,597	$45,251	$44,903	$44,553	$43,159	$42,805	$42,449	$42,091	$41,731	$42,411	$42,046	$41,879	$41,309	$40,937	$885,080
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	($5,247)	($12,124)	($12,029)	($11,653)	($11,557)	($11,461)	($11,365)	($11,267)	($11,451)	($11,352)	($11,253)	($11,153)	($11,053)	($142,966)
Net Cash Flow	$51,052	$47,300	$46,963	$46,624	$46,283	$45,941	$45,597	$40,004	$32,779	$32,524	$31,506	$31,247	$30,988	$30,726	$30,463	$30,960	$30,693	$30,425	$30,156	$29,884	$742,114
Federal Tax Credit	$125,498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$125,498
Cumulative Net Cash Flow	($241,776)	($194,476)	($147,513)	($100,889)	($54,606)	($8,665)	$36,931	$76,935	$109,714	$142,237	$173,743	$204,991	$235,978	$266,704	$297,168	$328,127	$358,821	$389,246	$419,402	$449,286	
Asset Valuation (at end of YR)	$342,677	$336,482	$329,893	$322,855	$315,301	$307,149	$298,301	$288,633	$277,994	$266,189	$253,714	$239,613	$223,481	$204,766	$182,693	$154,986	$120,838	$77,492	$20,349	($58,863)	

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3) Net metering rate (if relevant) dependant upon timing of Application for Cap Allocation (ACA) qualification.

4) Inverter(s) may need to be replaced during system life - model assumes at end of year 15

5) Asset Valuation based on a sliding value of future electric + incentive/REC revenues net of oparating expenses and a cap rate of 10%

6) REC values are assumed to be $0. / kWh

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Solar Photovoltaic System Project
Union Square 3.1
PRELIMINARY ESTIMATE

Financial Summary - Capital Purchase

System Size	186 kW	$2.25 per watt cost	($418,326)
Financing (0%)			$0
Net Systems Cost			**($418,326)**

Year 1 Details

30% Investment Tax Credit (utilized over 1 year(s))	$125,498
Year 1 Electricity Cost Avoidance	$0
Year 1 State Incentives	$52,307
Gross Revenue	**$177,805**
Year 1 Estimated Insurance & Maintenance Cost	($1,255)
Debt Service	$0
Net Revenue	**$176,550**

Financial Analysis

Year	Cash Flow	Cummulative
0	($418,326)	($418,326)
1	$176,550	($241,776)
2	$47,300	($194,476)
3	$46,963	($147,513)
4	$46,624	($100,889)
5	$46,283	($54,606)
6	$45,597	($9,010)
7	$45,941	$36,931
8	$40,004	$76,935
9	$32,779	$109,714
10	$32,524	$142,237
11	$31,506	$173,743
12	$31,247	$204,991
13	$30,988	$235,978
14	$30,463	$266,441
15	$30,960	$297,401
	$182,693	

Cash Flow Positive	**Year 7**	
Internal Rate of Return	**13%**	
Net Present Value (NPV) @ 8% discount	**$100,126**	
Asset Valuation after Year 15	**$182,693**	
Year 1 Solar Electric Production	**198,134**	kWh per year AC

Notes:

1) Cash Flow assumes 27% federal tax rate and that depreciation only offsets income taxes from incentive revenue.
2) Asset Valuation based on a cap rate of 10%
3) Systems are modelled as "stand alone" under SMART vs. behind the meter

Solar Project Financial Pro Forma: Union Square 3.3

Capital Purchase w/ MA SMART Incentives

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4/23/2019 PRELIMINARY ESTIMATE

Project Details

System Nameplate Capacity (DC)	214.1 kW	
Annual Electric Production (AC)	237,191 kWh	
Project Cost	$481,544	$2.25 per watt cost
Federal Tax Credit	(144,463)	-30%
After Credit System Cost	$337,080	
Financing	$0	0%
Down Payment	$481,544	100%
Internal Rate of Return	13.0%	
Levelized Cost of Electricity	($0.092) per kWh	
Net Present Value	$186,796 (at 6% discount rate)	

Assumptions	
Loan Term (yrs)	N/A
Electricity Rate	$0.123
Electricity Rate Adjustor	3.0%
Income Tax Rate	27%
Asset Valuation Cap Rate	10%
SMART Tariff	$0.2640
Metering	Stand-Alone
Block	2 - Eversource

Income Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Electricity Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MA SMART Revenue	$62,618	$62,274	$61,932	$61,591	$61,252	$60,915	$60,580	$60,247	$59,916	$59,586	$59,258	$58,933	$58,608	$58,286	$57,965	$57,647	$57,330	$57,014	$56,701	$56,389	$1,189,042
REC Revenues	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ESS Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue + Avoided Cost	$62,618	$62,274	$61,932	$61,591	$61,252	$60,915	$60,580	$60,247	$59,916	$59,586	$59,258	$58,933	$58,608	$58,286	$57,965	$57,647	$57,330	$57,014	$56,701	$56,389	$1,189,042
Insurance	($1,445)	($1,401)	($1,359)	($1,318)	($1,279)	($1,241)	($1,203)	($1,167)	($1,132)	($1,098)	($1,065)	($1,033)	($1,002)	($972)	($943)	($915)	($887)	($861)	($835)	($810)	($21,968)
Property Tax (PV PILOT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Maintenance & Operating Costs	$0	($3,823)	($3,919)	($4,017)	($4,117)	($4,220)	($4,326)	($4,434)	($4,545)	($4,659)	($6,179)	($6,298)	($6,421)	($6,546)	($6,674)	($5,402)	($5,538)	($5,676)	($5,818)	($5,963)	($98,576)
Federal Depreciation Expense	($409,312)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($409,312)
Interest Expense - Bank	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	($410,757)	($5,225)	($5,278)	($5,336)	($5,396)	($5,461)	($5,529)	($5,601)	($5,677)	($5,757)	($7,244)	($7,332)	($7,423)	($7,518)	($7,618)	($6,317)	($6,425)	($6,537)	($6,653)	($6,773)	($529,856)
Net Income	($348,138)	$57,049	$56,653	$56,255	$55,856	$55,454	$55,051	$54,646	$54,239	$53,829	$52,014	$51,601	$51,186	$50,768	$50,348	$51,329	$50,905	$50,478	$50,048	$49,616	$659,186
Loss Carryforward	($348,138)	($291,089)	($234,436)	($178,180)	($122,324)	($66,870)	($11,819)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	($11,563)	($14,644)	($14,534)	($14,044)	($13,932)	($13,820)	($13,707)	($13,594)	($13,859)	($13,744)	($13,629)	($13,513)	($13,396)	($177,980)

Note: Assumes depreciation is used as a 'Loss Carry Forward' to offset SREC Income.
If depreciation is able to be fully used immediately, in first year it's value would be: $110,514

Cash Flow Statement																					
Avoided Cost + Revenue	$62,618	$62,274	$61,932	$61,591	$61,252	$60,915	$60,580	$60,247	$59,916	$59,586	$59,258	$58,933	$58,608	$58,286	$57,965	$57,647	$57,330	$57,014	$56,701	$58,389	$1,189,042
Operating Expenses	($1,445)	($5,225)	($5,278)	($5,336)	($5,396)	($5,461)	($5,529)	($5,601)	($5,677)	($5,757)	($7,244)	($7,332)	($7,423)	($7,518)	($7,618)	($6,317)	($6,425)	($6,537)	($6,653)	($6,773)	($120,544)
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow Before Taxes	$61,174	$57,049	$56,653	$56,255	$55,858	$55,454	$55,051	$54,646	$54,239	$53,829	$52,014	$51,601	$51,186	$50,768	$50,348	$51,329	$50,905	$50,478	$50,048	$49,618	$1,088,498
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	($11,563)	($14,644)	($14,534)	($14,044)	($13,932)	($13,820)	($13,707)	($13,594)	($13,859)	($13,744)	($13,629)	($13,513)	($13,396)	($177,980)
Net Cash Flow	$61,174	$57,049	$56,653	$56,255	$55,856	$55,454	$55,051	$43,083	$39,594	$39,295	$37,970	$37,669	$37,365	$37,061	$36,754	$37,470	$37,160	$36,849	$36,535	$36,219	$890,518
Federal Tax Credit	$144,463	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$144,463
Cumulative Net Cash Flow	($275,907)	($218,857)	($162,204)	($105,949)	($50,093)	$5,361	$60,412	$103,495	$143,089	$182,385	$220,355	$258,024	$295,389	$332,450	$369,204	$406,674	$443,834	$480,683	$517,218	$553,438	
Asset Valuation (at end of YR)	$414,883	$407,508	$399,662	$391,277	$382,274	$372,554	$361,999	$350,462	$337,759	$323,658	$308,863	$292,133	$272,988	$250,768	$224,554	$191,456	$150,648	$98,828	$30,495	($64,257)	

Notes:

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2) Qualification for the state incentive program are assumptions and timing dependent.

3) Net metering rate (if relevant) dependant upon timing of Application for Cap Allocation (ACA) qualification.

4) Inverter(s) may need to be replaced during system life - model assumes at end of year 15

5) Asset Valuation based on a sliding value of future electric + incentive/REC revenues net of operating expenses and a cap rate of 10%

6) REC values are assumed to be $0. / kWh

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Union Square 3.3

PRELIMINARY ESTIMATE

Financial Summary - Capital Purchase

System Size	214 kW	$2.25 per watt cost	($481,544)
Financing (0%)			$0
Net Systems Cost			**($481,544)**

Year 1 Details

30% Investment Tax Credit (utilized over 1 year(s))	$144,463
Year 1 Electricity Cost Avoidance	$0
Year 1 State Incentives	$62,618
Gross Revenue	**$207,081**
Year 1 Estimated Insurance & Maintenance Cost	($1,445)
Debt Service	$0
Net Revenue	**$205,637**

Financial Analysis

Year	Cash Flow	Cummulative
0	($481,544)	($481,544)
1	$205,637	($275,907)
2	$57,049	($218,857)
3	$56,653	($162,204)
4	$56,255	($105,949)
5	$55,856	($50,093)
6	$55,051	$4,958
7	$55,454	$60,412
8	$43,083	$103,495
9	$39,594	$143,089
10	$39,295	$182,385
11	$37,970	$220,355
12	$37,669	$258,024
13	$37,365	$295,389
14	$36,754	$332,143
15	$37,470	$369,614
	$224,554	

Cash Flow Positive	**Year 6**	
Internal Rate of Return	**14%**	
Net Present Value (NPV) @ 8% discount	**$134,533**	
Asset Valuation after Year 15	**$224,554**	
Year 1 Solar Electric Production	**237,191**	kWh per year AC

Notes:

1) Cash Flow assumes 27% federal tax rate and that depreciation only offsets income taxes from incentive revenue.
2) Asset Valuation based on a cap rate of 10%
3) Systems are modelled as "stand alone" under SMART vs. behind the meter

Solar Project Financial Pro Forma: Union Square 4.1

4/23/2019 PRELIMINARY ESTIMATE

Capital Purchase w/ MA SMART Incentives

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Project Details

System Nameplate Capacity (DC)	33.9	kW	
Annual Electric Production (AC)	38,684	kWh	
Project Cost	$118,303	$3.49	per watt cost
Federal Tax Credit	(35,491)	-30%	
After Credit System Cost	$82,812		
Financing	$0	0%	
Down Payment	$118,303	100%	
Internal Rate of Return	6.0%		
Levelized Cost of Electricity	($0.051)	per kWh	
Net Present Value	($66)	(at 6% discount rate)	

Assumptions	
Loan Term (yrs)	N/A
Electricity Rate	$0.123
Electricity Rate Adjustor	3.0%
Income Tax Rate	27%
Asset Valuation Cap Rate	10%
SMART Tariff	$0.2640
Metering	Stand-Alone
Block	2 - Eversource

Income Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Electricity Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MA SMART Revenue	$10,212	$10,156	$10,100	$10,045	$9,990	$8,835	$9,880	$9,826	$9,772	$9,718	$9,664	$9,611	$9,558	$9,506	$9,454	$9,402	$9,350	$9,298	$9,247	$9,196	$193,921
REC Revenues	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ESS Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue + Avoided Cost	$10,212	$10,156	$10,100	$10,045	$9,990	$9,935	$9,880	$9,826	$9,772	$9,718	$9,664	$9,611	$9,558	$9,506	$9,454	$9,402	$9,350	$9,298	$9,247	$9,196	$193,921
Insurance	($355)	($344)	($334)	($324)	($314)	($305)	($296)	($287)	($278)	($270)	($262)	($254)	($246)	($239)	($232)	($225)	($218)	($211)	($205)	($199)	($5,397)
Property Tax (PV PILOT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Maintenance & Operating Costs	$0	($1,428)	($1,463)	($1,500)	($1,537)	($1,576)	($1,615)	($1,656)	($1,697)	($1,740)	($2,154)	($2,199)	($2,245)	($2,292)	($2,340)	($2,017)	($2,068)	($2,119)	($2,172)	($2,227)	($36,045)
Federal Depreciation Expense	($100,558)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($100,558)
Interest Expense - Bank	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	($100,913)	($1,772)	($1,787)	($1,824)	($1,852)	($1,881)	($1,911)	($1,942)	($1,975)	($2,009)	($2,416)	($2,453)	($2,491)	($2,530)	($2,571)	($2,242)	($2,286)	($2,331)	($2,378)	($2,426)	($142,000)
Net Income	($90,700)	$8,384	$8,303	$8,221	$8,138	$8,054	$7,968	$7,883	$7,796	$7,709	$7,248	$7,158	$7,067	$6,975	$6,882	$7,160	$7,064	$6,968	$6,870	$8,771	$51,921
Loss Carryforward	($90,700)	($82,316)	($74,013)	($65,792)	($57,654)	($49,600)	($41,631)	($33,747)	($25,951)	($18,242)	($10,994)	($3,836)	$0	$0	$0	$0	$0	$0	$0	$0	
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($873)	($1,883)	($1,858)	($1,933)	($1,907)	($1,881)	($1,855)	($1,828)	($14,019)

Note: Assumes depreciation is used as a 'Loss Carry Forward' to offset SREC income.
If depreciation is able to be fully used immediately, in first year it's value would be: $27,151

Cash Flow Statement																					
Avoided Cost + Revenue	$10,212	$10,156	$10,100	$10,045	$9,990	$9,835	$9,880	$9,826	$9,772	$9,718	$9,664	$9,611	$9,558	$9,508	$9,454	$9,402	$9,350	$9,298	$9,247	$9,196	$193,921
Operating Expenses	($355)	($1,772)	($1,787)	($1,824)	($1,852)	($1,881)	($1,911)	($1,942)	($1,975)	($2,009)	($2,416)	($2,453)	($2,491)	($2,530)	($2,571)	($2,242)	($2,286)	($2,331)	($2,378)	($2,426)	($41,442)
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow Before Taxes	$9,858	$8,384	$8,303	$8,221	$8,138	$8,054	$7,969	$7,883	$7,786	$7,709	$7,248	$7,158	$7,067	$6,975	$6,882	$7,160	$7,064	$6,968	$8,870	$8,771	$152,479
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($873)	($1,883)	($1,858)	($1,933)	($1,907)	($1,881)	($1,855)	($1,828)	($14,019)
Net Cash Flow	$9,858	$8,384	$8,303	$8,221	$8,138	$8,054	$7,969	$7,883	$7,796	$7,709	$7,248	$7,158	$6,195	$5,092	$5,024	$5,226	$5,157	$5,086	$5,015	$4,943	$138,460
Federal Tax Credit	$35,491	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$35,491
Cumulative Net Cash Flow	($72,955)	($64,570)	($56,267)	($48,046)	($39,908)	($31,854)	($23,885)	($16,002)	($8,206)	($497)	$6,751	$13,910	$20,105	$25,187	$30,221	$35,447	$40,604	$45,690	$50,705	$55,648	
Asset Valuation (at end of YR)	$56,528	$55,181	$53,773	$52,265	$50,652	$48,919	$47,045	$45,006	$42,772	$40,305	$37,820	$35,027	$31,851	$28,188	$23,893	$18,343	$11,533	$2,925	($8,379)	($23,994)	

Notes:

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2) Qualification for the state incentive program are assumptions and timing dependent.

3) Net metering rate (if relevant) dependant upon timing of Application for Cap Allocation (ACA) qualification.

4) Inverter(s) may need to be replaced during system life - model assumes at end of year 15

5) Asset Valuation based on a sliding value of future electric + incentive/REC revenues net of operating expenses and a cap rate of 10%

6) REC values are assumed to be $0. / kWh

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Solar Photovoltaic System Project
Union Square 4.1
PRELIMINARY ESTIMATE

Financial Summary - Capital Purchase

System Size	34 kW	$3.49 per watt cost	($118,303)
Financing (0%)			$0
Net Systems Cost			**($118,303)**

Year 1 Details

30% Investment Tax Credit (utilized over 1 year(s))	$35,491
Year 1 Electricity Cost Avoidance	$0
Year 1 State Incentives	$10,212
Gross Revenue	**$45,703**
Year 1 Estimated Insurance & Maintenance Cost	($355)
Debt Service	$0
Net Revenue	**$45,349**

Financial Analysis

Year	Cash Flow	Cummulative
0	($118,303)	($118,303)
1	$45,349	($72,955)
2	$8,384	($64,570)
3	$8,303	($56,267)
4	$8,221	($48,046)
5	$8,138	($39,908)
6	$7,969	($31,939)
7	$8,054	($23,885)
8	$7,883	($16,002)
9	$7,796	($8,206)
10	$7,709	($497)
11	$7,248	$6,751
12	$7,158	$13,910
13	$6,195	$20,105
14	$5,024	$25,129
15	$5,226	$30,355
	$23,893	

Cash Flow Positive	**Year 11**	
Internal Rate of Return	**6%**	
Net Present Value (NPV) @ 8% discount	**($10,130)**	
Asset Valuation after Year 15	**$23,893**	
Year 1 Solar Electric Production	**38,684**	kWh per year AC

Notes:

1) Cash Flow assumes 27% federal tax rate and that depreciation only offsets income taxes from incentive revenue.
2) Asset Valuation based on a cap rate of 10%
3) Systems are modelled as "stand alone" under SMART vs. behind the meter

Solar Project Financial Pro Forma: Union Square 4.3

4/23/2019 PRELIMINARY ESTIMATE

Capital Purchase w/ MA SMART Incentives

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Project Details

System Nameplate Capacity (DC)	93.6	kW	
Annual Electric Production (AC)	113,537	kWh	
Project Cost	$244,152	$2.61	per watt cost
Federal Tax Credit	(73,246)	-30%	
After Credit System Cost	$170,907		
Financing	$0	0%	
Down Payment	$244,152	100%	
Internal Rate of Return	11.6%		
Levelized Cost of Electricity	($0.065)	per kWh	
Net Present Value	$76,663	(at 6% discount rate)	

Assumptions	
Loan Term (yrs)	N/A
Electricity Rate	$0.123
Electricity Rate Adjustor	3.0%
Income Tax Rate	27%
Asset Valuation Cap Rate	10%
SMART Tariff	$0.2640
Metering	Stand-Alone
Block	2 - Eversource

Income Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Electricity Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MA SMART Revenue	$29,974	$29,809	$29,645	$29,482	$29,320	$29,158	$28,998	$28,839	$28,680	$28,522	$28,365	$28,209	$28,054	$27,900	$27,746	$27,594	$27,442	$27,291	$27,141	$26,992	$569,162
REC Revenues	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ESS Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue + Avoided Cost	$29,974	$29,609	$29,645	$29,482	$29,320	$29,158	$26,996	$28,839	$28,680	$26,522	$28,365	$28,209	$26,054	$27,900	$27,746	$27,594	$27,442	$27,291	$27,141	$28,992	$569,162
Insurance	($732)	($710)	($689)	($668)	($648)	($629)	($610)	($592)	($574)	($557)	($540)	($524)	($508)	($493)	($478)	($464)	($450)	($436)	($423)	($411)	($11,138)
Property Tax (PV PILOT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Maintenance & Operating Costs	$0	($2,423)	($2,483)	($2,545)	($2,609)	($2,674)	($2,741)	($2,810)	($2,880)	($2,952)	($3,547)	($3,622)	($3,700)	($3,779)	($3,861)	($3,423)	($3,509)	($3,596)	($3,686)	($3,779)	($60,620)
Federal Depreciation Expense	($207,529)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($207,529)
Interest Expense - Bank	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	($208,262)	($3,133)	($3,172)	($3,214)	($3,257)	($3,303)	($3,351)	($3,401)	($3,454)	($3,509)	($4,087)	($4,146)	($4,208)	($4,272)	($4,339)	($3,887)	($3,959)	($4,033)	($4,110)	($4,189)	($279,266)
Net Income	($176,266)	$26,676	$26,472	$26,266	$28,062	$25,855	$25,647	$25,437	$25,228	$25,014	$24,278	$24,063	$23,846	$23,827	$23,407	$23,707	$23,483	$23,258	$23,031	$22,603	$269,874
Loss Carryforward	($178,288)	($151,613)	($125,140)	($98,872)	($72,810)	($46,954)	($21,308)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	($1,115)	($6,811)	($6,754)	($6,555)	($6,497)	($6,438)	($6,379)	($6,320)	($6,401)	($6,341)	($6,280)	($6,218)	($8,157)	($78,266)

Note: Assumes depreciation is used as a 'Loss Carry Forward' to offset SREC income.
If depreciation is able to be fully used immediately, in first year it's value would be: $56,033

Cash Flow Statement																					
Avoided Cost + Revenue	$29,974	$29,809	$29,645	$29,482	$29,320	$29,158	$28,998	$28,839	$28,680	$28,522	$28,365	$28,209	$28,054	$27,900	$27,746	$27,594	$27,442	$27,291	$27,141	$26,992	$569,162
Operating Expenses	($732)	($3,133)	($3,172)	($3,214)	($3,257)	($3,303)	($3,351)	($3,401)	($3,454)	($3,509)	($4,087)	($4,146)	($4,208)	($4,272)	($4,339)	($3,887)	($3,959)	($4,033)	($4,110)	($4,189)	($71,758)
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow Before Taxes	$29,241	$26,676	$26,472	$26,268	$26,062	$25,855	$25,647	$25,437	$25,228	$25,014	$24,278	$24,063	$23,846	$23,627	$23,407	$23,707	$23,483	$23,258	$23,031	$22,803	$497,403
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	($1,115)	($6,811)	($6,754)	($6,555)	($6,497)	($6,438)	($6,379)	($6,320)	($6,401)	($6,341)	($6,280)	($6,218)	($8,157)	($78,266)
Net Cash Flow	$29,241	$26,676	$26,472	$26,268	$26,062	$25,855	$25,647	$24,322	$18,415	$18,260	$17,723	$17,566	$17,408	$17,248	$17,087	$17,306	$17,143	$16,979	$16,813	$16,646	$419,137
Federal Tax Credit	$73,246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$73,248
Cumulative Net Cash Flow	($141,665)	($114,990)	($88,517)	($62,249)	($36,187)	($10,332)	$15,315	$39,638	$58,053	$76,312	$94,036	$111,602	$129,009	$146,257	$163,345	$180,651	$197,794	$214,772	$231,585	$246,231	
Asset Valuation (at end of YR)	$190,921	$187,315	$183,483	$179,393	$175,008	$170,279	$165,152	$159,556	$153,403	$148,583	$139,325	$131,130	$121,762	$110,904	$98,109	$82,153	$62,506	$37,586	$4,759	($40,716)	

Notes:

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2) Qualification for the state incentive program are assumptions and timing dependent.

3) Net metering rate (if relevant) dependant upon timing of Application for Cap Allocation (ACA) qualification.

4) Inverter(s) may need to be replaced during system life - model assumes at end of year 15

5) Asset Valuation based on a sliding value of future electric + incentive/REC revenues net of operating expenses and a cap rate of 10%

6) REC values are assumed to be $0. / kWh

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Union Square 4.3
PRELIMINARY ESTIMATE

Financial Summary - Capital Purchase

System Size	94 kW	$2.61 per watt cost	($244,152)
Financing (0%)			$0
Net Systems Cost			**($244,152)**

Year 1 Details

30% Investment Tax Credit (utilized over 1 year(s))	$73,246
Year 1 Electricity Cost Avoidance	$0
Year 1 State Incentives	$29,974
Gross Revenue	**$103,219**
Year 1 Estimated Insurance & Maintenance Cost	($732)
Debt Service	$0
Net Revenue	**$102,487**

Financial Analysis

Year	Cash Flow	Cummulative
0	($244,152)	($244,152)
1	$102,487	($141,665)
2	$26,676	($114,990)
3	$26,472	($88,517)
4	$26,268	($62,249)
5	$26,062	($36,187)
6	$25,647	($10,540)
7	$25,855	$15,315
8	$24,322	$39,638
9	$18,415	$58,053
10	$18,260	$76,312
11	$17,723	$94,036
12	$17,566	$111,602
13	$17,408	$129,009
14	$17,087	$146,097
15	$17,306	$163,403
	$98,109	

Cash Flow Positive	**Year 7**	
Internal Rate of Return	**12%**	
Net Present Value (NPV) @ 8% discount	**$50,574**	
Asset Valuation after Year 15	**$98,109**	
Year 1 Solar Electric Production	**113,537**	kWh per year AC

Notes:

1) Cash Flow assumes 27% federal tax rate and that depreciation only offsets income taxes from incentive revenue.
2) Asset Valuation based on a cap rate of 10%
3) Systems are modelled as "stand alone" under SMART vs. behind the meter

Solar Project Financial Pro Forma: Union Square 5.2

Capital Purchase w/ MA SMART Incentives

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4/23/2019 PRELIMINARY ESTIMATE

Project Details

System Nameplate Capacity (DC)	28.5	kW	
Annual Electric Production (AC)	29,302	kWh	
Project Cost	$99,651	$3.76	per watt cost
Federal Tax Credit	(29,895)	-30%	
After Credit System Cost	$69,756		
Financing	$0	0%	
Down Payment	$99,651	100%	

Assumptions	
Loan Term (yrs)	N/A
Electricity Rate	$0.123
Electricity Rate Adjustor	3.0%
Income Tax Rate	27%
Asset Valuation Cap Rate	10%
SMART Tariff	$0.3456
Metering	Stand-Alone
Block	2 - Eversource

Levelized Cost of Electricity ($0.015) per kWh
Net Present Value ($17,640) (at 6% discount rate)

Income Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Electricity Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MA SMART Revenue	$10,127	$10,071	$10,016	$9,961	$9,906	$9,851	$9,797	$9,743	$9,690	$9,636	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$98,798
REC Revenues	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ESS Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue + Avoided Cost	$10,127	$10,071	$10,016	$9,961	$9,906	$9,851	$9,797	$9,743	$9,690	$9,636	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$98,798
Insurance	($299)	($290)	($281)	($273)	($265)	($257)	($249)	($242)	($234)	($227)	($220)	($214)	($207)	($201)	($195)	($189)	($184)	($178)	($173)	($168)	($4,546)
Property Tax (PV PILOT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Maintenance & Operating Costs	$0	($1,323)	($1,356)	($1,390)	($1,425)	($1,460)	($1,497)	($1,534)	($1,572)	($1,612)	($1,900)	($1,941)	($1,983)	($2,027)	($2,071)	($1,869)	($1,916)	($1,964)	($2,013)	($2,063)	($32,915)
Federal Depreciation Expense	($84,704)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($84,704)
Interest Expense - Bank	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	($85,002)	($1,813)	($1,637)	($1,663)	($1,689)	($1,717)	($1,746)	($1,776)	($1,807)	($1,839)	($2,120)	($2,155)	($2,191)	($2,228)	($2,266)	($2,059)	($2,100)	($2,142)	($2,186)	($2,231)	($122,165)
Net Income	($74,876)	$8,458	$8,378	$8,298	$8,217	$8,134	$8,051	$7,968	$7,883	$7,797	($2,120)	($2,155)	($2,191)	($2,228)	($2,266)	($2,059)	($2,100)	($2,142)	($2,186)	($2,231)	($23,368)
Loss Carryforward	($74,876)	($66,418)	($58,039)	($49,741)	($41,525)	($33,390)	($25,339)	($17,371)	($9,489)	($1,691)	($3,811)	($5,966)	($8,157)	($10,385)	($12,651)	($14,709)	($16,809)	($18,951)	($21,137)	($23,368)	
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Note: Assumes depreciation is used as a 'Loss Carry Forward' to offset SREC Income.
If depreciation is able to be fully used immediately, in first year it's value would be: $22,870

Cash Flow Statement																					
Avoided Cost + Revenue	$10,127	$10,071	$10,016	$9,961	$9,906	$9,851	$9,797	$9,743	$9,690	$9,636	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$98,798
Operating Expenses	($299)	($1,613)	($1,637)	($1,663)	($1,689)	($1,717)	($1,746)	($1,776)	($1,807)	($1,839)	($2,120)	($2,155)	($2,191)	($2,228)	($2,266)	($2,059)	($2,100)	($2,142)	($2,186)	($2,231)	($37,462)
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow Before Taxes	$9,828	$8,458	$8,378	$8,298	$8,217	$8,134	$8,051	$7,968	$7,883	$7,797	($2,120)	($2,155)	($2,191)	($2,228)	($2,266)	($2,059)	($2,100)	($2,142)	($2,186)	($2,231)	$61,336
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Cash Flow	$9,828	$8,458	$8,378	$8,298	$8,217	$8,134	$8,051	$7,968	$7,883	$7,797	($2,120)	($2,155)	($2,191)	($2,228)	($2,266)	($2,059)	($2,100)	($2,142)	($2,186)	($2,231)	$61,336
Federal Tax Credit	$29,895	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$29,895
Cumulative Net Cash Flow	($59,928)	($51,470)	($43,091)	($34,794)	($26,577)	($18,443)	($10,391)	($2,424)	$5,459	$13,256	$11,136	$8,982	$6,791	$4,563	$2,297	$238	($1,861)	($4,003)	($6,189)	($8,420)	
Asset Valuation (at end of YR)	$18,600	$15,605	$12,378	$8,886	$5,090	$941	($3,618)	($8,660)	($14,274)	($20,575)	($20,688)	($20,786)	($20,866)	($20,920)	($20,941)	($21,191)	($21,445)	($21,703)	($21,966)	($22,232)	

Notes:
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2) Qualification for the state incentive program are assumptions and timing dependent.
3) Net metering rate (if relevant) dependant upon timing of Application for Cap Allocation (ACA) qualification.
4) Inverter(s) may need to be replaced during system life - model assumes at end of year 15
5) Asset Valuation based on a sliding value of future electric + incentive/REC revenues net of operating expenses and a cap rate of 10%
6) REC values are assumed to be $0. / kWh

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Solar Photovoltaic System Project
Union Square 5.2
PRELIMINARY ESTIMATE

Financial Summary - Capital Purchase

System Size	27 kW	$3.76 per watt cost	($99,651)
Financing (0%)			$0
Net Systems Cost			**($99,651)**

Year 1 Details

30% Investment Tax Credit (utilized over 1 year(s))	$29,895
Year 1 Electricity Cost Avoidance	$0
Year 1 State Incentives	$10,127
Gross Revenue	**$40,022**
Year 1 Estimated Insurance & Maintenance Cost	($299)
Debt Service	$0
Net Revenue	**$39,723**

Financial Analysis

Year	Cash Flow	Cummulative
0	($99,651)	($99,651)
1	$39,723	($59,928)
2	$8,458	($51,470)
3	$8,378	($43,091)
4	$8,298	($34,794)
5	$8,217	($26,577)
6	$8,051	($18,526)
7	$8,134	($10,391)
8	$7,968	($2,424)
9	$7,883	$5,459
10	$7,797	$13,256
11	($2,120)	$11,136
12	($2,155)	$8,982
13	($2,191)	$6,791
14	($2,266)	$4,525
15	($2,059)	$2,466
	($20,941)	

Cash Flow Positive	**Year 9**	
Internal Rate of Return	**N/A**	
Net Present Value (NPV) @ 8% discount	**($23,797)**	
Asset Valuation after Year 15	**($20,941)**	
Year 1 Solar Electric Production	**29,302**	kWh per year AC

Notes:

1) Cash Flow assumes 27% federal tax rate and that depreciation only offsets income taxes from incentive revenue.
2) Asset Valuation based on a cap rate of 10%
3) Systems are modelled as "stand alone" under SMART vs. behind the meter

Solar Project Financial Pro Forma: Union Square 7.1

4/23/2019 PRELIMINARY ESTIMATE

Capital Purchase w/ MA SMART Incentives

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Project Details

System Nameplate Capacity (DC)	60.8	kW	
Annual Electric Production (AC)	68,123	kWh	
Project Cost	$174,121		$2.88 per watt cost
Federal Tax Credit	(52,236)		-30%
After Credit System Cost	$121,885		
Financing	$0		0%
Down Payment	$174,121		100%
Internal Rate of Return	8.8%		
Levelized Cost of Electricity	($0.069)	per kWh	
Net Present Value	$25,227	(at 6% discount rate)	

Assumptions	
Loan Term (yrs)	N/A
Electricity Rate	$0.123
Electricity Rate Adjustor	3.0%
Income Tax Rate	27%
Asset Valuation Cap Rate	10%
SMART Tariff	$0.2640
Metering	Stand-Alone
Block	2 - Eversource

Income Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Electricity Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MA SMART Revenue	$17,984	$17,885	$17,787	$17,689	$17,592	$17,495	$17,399	$17,303	$17,208	$17,113	$17,019	$16,926	$16,833	$16,740	$16,648	$16,556	$16,465	$16,375	$16,285	$16,195	$341,499
REC Revenues	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ESS Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue + Avoided Cost	$17,984	$17,885	$17,787	$17,689	$17,592	$17,495	$17,399	$17,303	$17,208	$17,113	$17,019	$16,926	$16,833	$16,740	$16,648	$16,556	$16,465	$16,375	$16,285	$16,195	$341,499
Insurance	($522)	($507)	($491)	($477)	($462)	($449)	($435)	($422)	($409)	($397)	($385)	($374)	($362)	($352)	($341)	($331)	($321)	($311)	($302)	($293)	($7,944)
Property Tax (PV PILOT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Maintenance & Operating Costs	$0	($1,969)	($2,019)	($2,069)	($2,121)	($2,174)	($2,228)	($2,284)	($2,341)	($2,399)	($2,981)	($3,042)	($3,105)	($3,170)	($3,236)	($2,783)	($2,852)	($2,924)	($2,997)	($3,072)	($49,765)
Federal Depreciation Expense	($148,003)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($148,003)
Interest Expense - Bank	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	($148,525)	($2,476)	($2,510)	($2,546)	($2,583)	($2,622)	($2,663)	($2,706)	($2,750)	($2,797)	($3,366)	($3,416)	($3,468)	($3,521)	($3,577)	($3,113)	($3,173)	($3,235)	($3,299)	($3,364)	($205,711)
Net Income	($130,541)	$15,409	$15,277	$15,143	$15,009	$14,873	$14,736	$14,597	$14,458	$14,317	$13,653	$13,510	$13,365	$13,219	$13,071	$13,443	$13,292	$13,140	$12,986	$12,831	$135,788
Loss Carryforward	($130,541)	($115,132)	($99,855)	($84,711)	($69,703)	($54,830)	($40,094)	($25,497)	($11,039)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	$0	$0	($885)	($3,686)	($3,648)	($3,609)	($3,569)	($3,529)	($3,630)	($3,589)	($3,548)	($3,506)	($3,464)	($36,663)

Note: Assumes depreciation is used as a 'Loss Carry Forward' to offset SREC Income.
If depreciation is able to be fully used immediately, in first year it's value would be: $39,961

Cash Flow Statement																					
Avoided Cost + Revenue	$17,984	$17,885	$17,787	$17,689	$17,592	$17,495	$17,399	$17,303	$17,208	$17,113	$17,019	$16,926	$16,833	$16,740	$16,648	$16,556	$16,465	$16,375	$16,285	$16,195	$341,499
Operating Expenses	($522)	($2,476)	($2,510)	($2,546)	($2,583)	($2,622)	($2,663)	($2,706)	($2,750)	($2,797)	($3,366)	($3,416)	($3,468)	($3,521)	($3,577)	($3,113)	($3,173)	($3,235)	($3,299)	($3,364)	($57,708)
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow Before Taxes	$17,462	$15,409	$15,277	$15,143	$15,009	$14,873	$14,736	$14,597	$14,458	$14,317	$13,653	$13,510	$13,365	$13,219	$13,071	$13,443	$13,292	$13,140	$12,988	$12,831	$283,791
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	$0	$0	($885)	($3,686)	($3,648)	($3,609)	($3,569)	($3,529)	($3,630)	($3,589)	($3,548)	($3,506)	($3,464)	($36,663)
Net Cash Flow	$17,462	$15,409	$15,277	$15,143	$15,009	$14,873	$14,736	$14,597	$14,458	$13,432	$9,967	$9,862	$9,756	$9,650	$9,542	$9,813	$9,703	$9,592	$9,480	$9,366	$247,128
Federal Tax Credit	$52,238	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$52,238
Cumulative Net Cash Flow	($104,423)	($89,014)	($73,737)	($58,593)	($43,584)	($28,712)	($13,976)	$621	$15,079	$28,511	$38,478	$48,340	$58,097	$67,746	$77,288	$87,101	$96,805	$106,397	$115,877	$125,243	
Asset Valuation (at end of YR)	$107,167	$104,907	$102,508	$99,951	$97,213	$94,265	$91,074	$87,597	$83,779	$79,555	$75,210	$70,316	$64,736	$58,285	$50,701	$41,030	$29,143	$14,090	($5,708)	($33,097)	

Notes:
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2) Qualification for the state incentive program are assumptions and timing dependant.
3) Net metering rate (if relevant) dependant upon timing of Application for Cap Allocation (ACA) qualification.
4) Inverter(s) may need to be replaced during system life - model assumes at end of year 15
5) Asset Valuation based on a sliding value of future electric + incentive/REC revenues net of operating expenses and a cap rate of 10%
6) REC values are assumed to be $0. / kWh

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Union Square 7.1

PRELIMINARY ESTIMATE

Financial Summary - Capital Purchase

System Size	61 kW	$2.86 per watt cost	($174,121)
Financing (0%)			$0
Net Systems Cost			**($174,121)**

Year 1 Details

30% Investment Tax Credit (utilized over 1 year(s))	$52,236
Year 1 Electricity Cost Avoidance	$0
Year 1 State Incentives	$17,984
Gross Revenue	**$70,221**
Year 1 Estimated Insurance & Maintenance Cost	($522)
Debt Service	$0
Net Revenue	**$69,698**

Financial Analysis

Year	Cash Flow	Cummulative
0	($174,121)	($174,121)
1	$69,698	($104,423)
2	$15,409	($89,014)
3	$15,277	($73,737)
4	$15,143	($58,593)
5	$15,009	($43,584)
6	$14,736	($28,849)
7	$14,873	($13,976)
8	$14,597	$621
9	$14,458	$15,079
10	$13,432	$28,511
11	$9,967	$38,478
12	$9,862	$48,340
13	$9,756	$58,097
14	$9,542	$67,638
15	$9,813	$77,452
	$50,701	

Cash Flow Positive	**Year 8**	
Internal Rate of Return	**9%**	
Net Present Value (NPV) @ 8% discount	**$8,632**	
Asset Valuation after Year 15	**$50,701**	
Year 1 Solar Electric Production	**68,123**	kWh per year AC

Notes:

1) Cash Flow assumes 27% federal tax rate and that depreciation only offsets income taxes from incentive revenue.
2) Asset Valuation based on a cap rate of 10%
3) Systems are modelled as "stand alone" under SMART vs. behind the meter

Solar Project Financial Pro Forma: Union Square 7.2

4/23/2019 PRELIMINARY ESTIMATE

Capital Purchase w/ MA SMART Incentives

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Project Details

System Nameplate Capacity (DC)	95.2 kW	
Annual Electric Production (AC)	114,497 kWh	
Project Cost	$247,595	$2.60 per watt cost
Federal Tax Credit	(74,278)	-30%
After Credit System Cost	$173,316	
Financing	$0	0%
Down Payment	$247,595	100%
Internal Rate of Return	11.7%	
Levelized Cost of Electricity	($0.085) per kWh	
Net Present Value	$76,555 (at 6% discount rate)	

Assumptions	
Loan Term (yrs)	N/A
Electricity Rate	$0.123
Electricity Rate Adjustor	3.0%
Income Tax Rate	27%
Asset Valuation Cap Rate	10%
SMART Tariff	$0.2640
Metering	Stand-Alone
Block	2 - Eversource

Income Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	20 Year Totals
Electricity Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MA SMART Revenue	$30,227	$30,061	$29,895	$29,731	$29,568	$29,405	$29,243	$29,082	$28,922	$28,763	$28,605	$28,448	$28,291	$28,136	$27,981	$27,827	$27,674	$27,522	$27,370	$27,220	$573,973
REC Revenues	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ESS Savings/Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue + Avoided Cost	$30,227	$30,061	$29,895	$29,731	$29,566	$29,405	$29,243	$29,082	$28,922	$28,763	$28,605	$28,448	$28,291	$28,136	$27,981	$27,627	$27,674	$27,522	$27,370	$27,220	$573,973
Insurance	($743)	($721)	($699)	($678)	($658)	($638)	($619)	($600)	($582)	($565)	($548)	($531)	($515)	($500)	($485)	($470)	($456)	($443)	($429)	($416)	($11,295)
Property Tax (PV PILOT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Maintenance & Operating Costs	$0	($2,444)	($2,505)	($2,568)	($2,632)	($2,698)	($2,765)	($2,835)	($2,905)	($2,978)	($3,574)	($3,650)	($3,728)	($3,808)	($3,891)	($3,454)	($3,540)	($3,629)	($3,719)	($3,812)	($61,137)
Federal Depreciation Expense	($210,456)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($210,456)
Interest Expense - Bank	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Expenses	($211,198)	($3,165)	($3,204)	($3,246)	($3,290)	($3,336)	($3,384)	($3,435)	($3,466)	($3,543)	($4,122)	($4,181)	($4,244)	($4,308)	($4,376)	($3,924)	($3,996)	($4,071)	($4,149)	($4,229)	($282,888)
Net Income	($180,971)	$26,696	$26,691	$28,485	$26,276	$26,069	$25,859	$25,648	$25,435	$25,221	$24,484	$24,266	$24,048	$23,827	$23,605	$23,903	$23,678	$23,451	$23,222	$22,991	$291,085
Loss Carryforward	($180,971)	($154,075)	($127,384)	($100,899)	($74,621)	($48,552)	($22,693)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	($798)	($6,867)	($6,810)	($6,611)	($6,552)	($6,493)	($6,433)	($6,373)	($6,454)	($6,393)	($6,332)	($6,270)	($6,208)	($78,593)

Note: Assumes depreciation is used as a 'Loss Carry Forward' to offset SREC Income.
If depreciation is able to be fully used immediately, in first year it's value would be; $56,823

Cash Flow Statement																					
Avoided Cost + Revenue	$30,227	$30,061	$29,895	$29,731	$29,568	$29,405	$29,243	$29,082	$28,922	$28,763	$28,605	$28,448	$28,291	$28,136	$27,981	$27,827	$27,674	$27,522	$27,370	$27,220	$573,973
Operating Expenses	($743)	($3,165)	($3,204)	($3,246)	($3,290)	($3,336)	($3,384)	($3,435)	($3,488)	($3,543)	($4,122)	($4,181)	($4,244)	($4,308)	($4,376)	($3,924)	($3,996)	($4,071)	($4,149)	($4,229)	($72,432)
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash Flow Before Taxes	$29,484	$28,896	$26,691	$26,485	$26,278	$26,069	$25,859	$25,648	$25,435	$25,221	$24,484	$24,266	$24,048	$23,627	$23,605	$23,903	$23,678	$23,451	$23,222	$22,991	$501,541
Income Tax (Owed) Benefit	$0	$0	$0	$0	$0	$0	$0	($798)	($6,867)	($6,810)	($6,611)	($6,552)	($6,493)	($6,433)	($6,373)	($6,454)	($6,393)	($6,332)	($6,270)	($6,208)	($76,593)
Net Cash Flow	$29,484	$26,896	$26,691	$26,485	$26,278	$26,069	$25,859	$24,850	$18,567	$18,411	$17,873	$17,714	$17,555	$17,394	$17,232	$17,449	$17,285	$17,119	$16,952	$16,784	$422,946
Federal Tax Credit	$74,278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$74,276
Cumulative Net Cash Flow	($143,632)	($116,936)	($90,245)	($63,760)	($37,482)	($11,413)	$14,446	$39,296	$57,863	$76,274	$94,147	$111,862	$129,417	$146,811	$164,043	$181,492	$198,777	$215,896	$232,848	$249,631	
Asset Valuation (at end of YR)	$192,529	$168,893	$165,029	$180,905	$176,482	$171,715	$166,544	$160,901	$154,697	$147,820	$140,499	$132,231	$122,782	$111,828	$98,920	$82,830	$63,016	$37,885	$4,781	($41,079)	

Notes:

1) Disclaimer: This solar model is for informational purposes only and no data contained in this solar model constitutes tax, legal, insurance or investment advice. The financial inputs throughout this solar model, whether electricity quotes, rebates, tax, or any other statement or statements regarding financial information, is obtained from sources which we believe reliable, but we do not warrant or guarantee the timeliness or accuracy of this information.

2) Qualification for the state incentive program are assumptions and timing dependent.

3) Net metering rate (if relevant) dependant upon timing of Application for Cap Allocation (ACA) qualification.

4) Inverter(s) may need to be replaced during system life - model assumes at end of year 15

5) Asset Valuation based on a sliding value of future electric + incentive/REC revenues net of operating expenses and a cap rate of 10%

6) REC values are assumed to be $0. / kWh

solectenergy
Smart Solar. Smart Business.

Solar Photovoltaic System Project
Union Square 7.2
PRELIMINARY ESTIMATE

Financial Summary - Capital Purchase

System Size	95 kW	$2.60 per watt cost	($247,595)
Financing (0%)			$0
Net Systems Cost			**($247,595)**

Year 1 Details

30% Investment Tax Credit (utilized over 1 year(s))	$74,278
Year 1 Electricity Cost Avoidance	$0
Year 1 State Incentives	$30,227
Gross Revenue	**$104,506**
Year 1 Estimated Insurance & Maintenance Cost	($743)
Debt Service	$0
Net Revenue	**$103,763**

Financial Analysis

Year	Cash Flow	Cummulative
0	($247,595)	($247,595)
1	$103,763	($143,832)
2	$26,896	($116,936)
3	$26,691	($90,245)
4	$26,485	($63,760)
5	$26,278	($37,482)
6	$25,859	($11,623)
7	$26,069	$14,446
8	$24,850	$39,296
9	$18,567	$57,863
10	$18,411	$76,274
11	$17,873	$94,147
12	$17,714	$111,862
13	$17,555	$129,417
14	$17,232	$146,649
15	$17,449	$164,098
	$98,920	

Cash Flow Positive	**Year 7**	
Internal Rate of Return	**12%**	
Net Present Value (NPV) @ 8% discount	**$50,209**	
Asset Valuation after Year 15	**$98,920**	
Year 1 Solar Electric Production	**114,497**	kWh per year AC

Notes:

1) Cash Flow assumes 27% federal tax rate and that depreciation only offsets income taxes from incentive revenue.
2) Asset Valuation based on a cap rate of 10%
3) Systems are modelled as "stand alone" under SMART vs. behind the meter

Responses to Comments Submitted on the EENF

APPENDIX F RESPONSE TO COMMENTS SUBMITTED ON THE ENF

This Appendix provides updated responses to the comments received on the ENF filed with the MEPA Office on July 2, 2018, as requested in the DEIR Certificate. The letters have been reproduced and individual comments coded in the margins. Responses to the comments follow each individual letter and can be matched using the comment code numbers. Table F-1 provides a list of letters received and the comment identifier. Letters that were supportive of the Project and did not have comments to respond to have not been included in this Appendix (but were included in the DEIR), but are listed in Table F-2. As requested by the DEIR Certificate, the Project team has responded directly to each comment and has included references to sections for more details where appropriate.

Table F-1 Comment Letters Received on the ENF

Massachusetts Department of Transportation	DOT
Department of Energy Resources	DOER
Department of Environmental Protection, Northeast Regional Office	DEP
Department of Environmental Protection, Bureau of Air and Waste	DEP2
Massachusetts Historical Commission	MHC
Massachusetts Water Resources Authority	MWRA
Metropolitan Area Planning Council	MAPC
Union Square Neighborhood Council	USNC
City of Cambridge	CC
WalkBoston	WB
Somerville Catholic Collaborative	SCC
Jean Martelli	JM
Frank J. Kautz, II	FK
Sara Claudia Murrow	SCM
Brendan C. Harris	BHC
Gregory W. Hill	GWH
Mia Lampbert	ML
Jacinta Areme	JA
Valerie Zinkus	VZ
Mary Jo Conelly	MJC
Penelope Taylor	PT
Sandra Brown	SB
Green and Open Somerville	GOS
Bill Cavellini	BC
Tori Antonino	TA
Jacob Kramer	JK

Table F-1 Comment Letters Received on the ENF (continued)

Wig Zamore	WZ
Rachel J. Weil	RW
Malcolm Cummings	MC
Anson Stewart and Mike Firestone	AS

Table F-2 Support Letters

Mayor Joseph Curtatone, City of Somerville	Stephen V. Mackey, Somerville Chamber of Commerce
Jeff Byrnes, Somerville YIMBY Steering Committee	Patrick Keefe
Philip Parsons, Union Square Main Streets	Cheryl Horan
John M. Connolly	Peter Brown
Justin D. Sofia	Sandra L. McGoldrick
Annie Nagle	Robert J. McGovern
Stuart Landucci	Courtney O'Keefe
Joshua Van Dyke	Jim Harvey
Thomas Bent	Edward Doherty
Maryann Heuston	Seth Grady
Andrew Wade	Jimi and Tolu Becks Oke
Yao Xiao	Brett Levy
Zac Zasloff	Rod Luarenz
Robert McWatters	Sarah Rodewald
Andrew Lalli	Josh Carel
John R. Wiseman	

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

August 23, 2018

Matthew Beaton, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RE: Somerville: Union Square – EENF
(EEA # 15889)

ATTN: MEPA Unit
Alex Strysky

Dear Secretary Beaton:

On behalf of the Massachusetts Department of Transportation, I am submitting comments regarding the proposed Union Square project in Somerville, as prepared by the Office of Transportation Planning. If you have any questions regarding these comments, please contact J. Lionel Lucien, P.E., Manager of the Public/Private Development Unit, at (857) 368-8862.

Sincerely,

David J. Mohler
Executive Director
Office of Transportation Planning

DJM/jll

Ten Park Plaza, Suite 4150, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

cc: Jonathan Gulliver, Administrator, Highway Division
Patricia Leavenworth, P.E., Chief Engineer, Highway Division
Neil Boudreau, Assistant Administrator of Traffic and Safety Engineering
Paul Stedman, District 5 Highway Director
Metropolitan Area Planning Council
Massachusetts Bay Transportation Authority
Office of Strategic Planning and Community Development, City of Somerville
PPDU Files

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

MEMORANDUM

TO: David J. Mohler, Executive Director
Office of Transportation Planning

FROM: J. Lionel Lucien, P.E., Manager
Public/Private Development Unit

DATE: August 23, 2018

RE: Somerville – Union Square Redevelopment
(EEA #15889)

The Public/Private Development Unit (PPDU) has reviewed the Environmental Notification Form (ENF) submitted by Union Square RELP Master Developer LLC (US2) and the Somerville Redevelopment Authority ("Proponent") for the proposed Union Square Redevelopment project in Somerville. The overall development is proposed to include the renovation of one building and the construction of 17 buildings, totaling approximately 2,397,000 square feet of residential, office, and commercial uses. The project also proposes approximately 157,000 square feet of new public open spaces, which includes 108,000 sf of new civic space, 27,000 sf of neighborhood space, and 15,100 sf of plaza that creates a point of entry and access to the new Massachusetts Bay Transportation Authority (MBTA) station. The project site is located in Union Square, which is also the location of a new MBTA station which will service the Green Line Extension (GLX) currently under construction and planned to open in 2021.

The project would be developed in several phases. The first phase would involve the construction of 166,000 square feet of office/lab space, approximately 29,000 sf of ground floor retail, and residential space comprising 450 housing units, which is anticipated to commence in 2019. The remainder of the development program is expected to be developed over time based on market demand. Approximately 290 parking spaces will be provided as part of Phase I, along with new public open spaces. Phase I also includes physical improvements related to the Union Square Station, including a connection from the public sidewalk to the new station platform, a drop-off/pick-up area for MBTA's the Ride paratransit program, sheltered and secured bicycle parking, employee restrooms, a janitor closet, and an MBTA lounge.

Based on the information presented in the EENF, the Phase I project would generate 4,992 unadjusted new trips on a typical weekday, including 2,089 vehicle trips, 1,361 transit trips, 959 bicycle trips, and 1,808 pedestrian trips. During the AM peak hour, the project would generate 188 vehicle trips, 122 transit trips, 86 bicycle trips, and 163 pedestrian trips. During the PM peak hour, the project would generate 229 vehicle trips, 149 transit trips, 105 bicycle trips and 198 pedestrian trips. The project requires a Chapter 40, Section 54A approval from MassDOT.

Ten Park Plaza, Suite 4150, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

The EENF includes a Phase I Traffic Impact and Access Study (TIAS) that generally conforms with the current *MassDOT/EOEEA Transportation Impact Assessment Guidelines*. The TIAS describes the City of Somerville's efforts to promote alternate travel means such as walking, bicycling, and public transportation over driving. With this reasoning and in light of the extension of the Green Line to serve this area, MassDOT is supportive of the Proponent's mitigation program primarily focused on alternative modes of transportation. The Proponent has requested a waiver to proceed with Phase I of the project pending the preparation of a full Environmental Impact Report for the full project. MassDOT does not object to the Proponent's waiver request. MassDOT, along with the GLX team, has met on numerous occasions with the Proponent to discuss the Project, including the Phase I component. We provide the following comments on Phase I; however, the Proponent has previously submitted a full transportation study for the project that we would further review as part of the EIR.

Traffic Operations

Capacity analyses were conducted for the weekday morning and weekday evening peak periods for the existing, future 2025 No-Build, and future 2025 Build conditions. The capacity analyses showed a number of locations are anticipated to operate at a level of service (LOS) E or F in both the future No Build and future Build conditions. In almost all other instances, project-generated trips for Phase I were not found to have significant impacts to already constrained operating conditions at study area intersections. The City of Somerville has already initiated a program of infrastructure improvements and transit changes consistent with their Neighborhood Plan. For example, Webster Street and Prospect Street were converted to two-way and pedestrian, cyclist and bus improvements were completed. These changes have already produced improved operating conditions within the Union Square area and are expected to mitigate the impacts associated with Phase I development.

Pedestrian Impacts

The EENF includes an evaluation of the sidewalk system in the vicinity of the project site that describes the existing infrastructure. A comprehensive pedestrian analysis was provided for the 2025 Build conditions in the Phase I study area. The Proponent has committed to improve the pedestrian environment by supporting the construction of 12-foot sidewalks on Somerville Avenue between Prospect Street and Allen Street, and creating a much wider pedestrian circulation area along Prospect Street. In addition, the Phase I project will include the construction of the main pedestrian access to Union Square Station and the provision of streetscape improvements such as lighting, landscaping, and curbing to encourage walking and enhance overall pedestrian safety in Union Square. The Proponent should work with the MBTA and the City of Somerville to ensure that access to the station is compliant with Americans with Disability Act standards and MBTA design standards. DOT.1

Bicycle Impacts

The EENF also includes an evaluation of the bicycle infrastructure within the study area. The City of Somerville has implemented a comprehensive bicycle infrastructure program at a number of corridors leading to the Union Square study area. The bicycle analysis conducted for Phase I indicates that with the recent addition of bicycle facilities, most of the streets in Union Square operate within acceptable conditions and provide good access for bicyclists. In addition, the Phase I project will include on-site bicycle parking (560 spaces within Phase I) and secured and covered bicycle storage for 90 MBTA users. Similarly for pedestrian access, the Proponent should work closely with MassDOT and the City of Somerville to provide a seamless connection between the existing and planned bicycle facilities in the study area. DOT.2

Public Transportation

The EENF also includes an evaluation of the transit system within the study area. The City of Somerville has worked with the MBTA to complete a transit analysis that included the impacts of Phase I of the project. The study took into consideration planned improvements by the MBTA in the study area, including future construction of the GLX. The analysis concluded that for the most part the expected MBTA transit network would accommodate the additional ridership associated with Phase I. A few bus routes may experience some level of overcrowding during peak hours but generally within acceptable conditions. The Proponent has committed to convey land toward station improvements, to work with the MBTA to provide access to the Ride service, and to provide amenities such as bathroom and lounge areas for MBTA drivers. These commitments are being worked out as part of a Memorandum of Agreement between the Proponent and the MBTA.

The Proponent must consult with MassDOT, the MBTA Service Planning Department, and the City of Somerville in exploration of additional mitigation measures to enhance transit service to the site. These measures could include the re-apportionment of parking areas along Prospect Street to extend the existing bus lane or create a second bus lane to improve bus service operations, which the City of Somerville and MBTA Service Planning Department have previously indicated interest in implementing. Finally, the Proponent must join or include in its tenant's lease agreements specific requirements to join the MBTA Corporate Pass Program. DOT.3 DOT.4

Transportation Demand Management (TDM)

The EENF includes a "Mobility Management Plan" which outlines a comprehensive TDM program for the project site. The Proponent will implement the following measures aimed at reducing site trip generation:

- Commitment to a 60% non-auto mode share, including an ongoing monitoring program in conjunction with the City;
- Assignment of an on-site TDM coordinator to oversee all TDM programs for each building;

- Assistance to site employees and residents with ride-matching and transportation planning;
- Dissemination of information on alternate modes of transportation and development of transportation-related marketing and education materials;
- Hosting of an annual mobility management educational meeting for tenants and their employees;
- Development and maintenance of information pertaining to pedestrian and bicycle access to and from the project site;
- Distribution of transit maps and passes;
- Requirement of tenant registration with the MassRIDES Emergency Ride Home program;
- Provision of secured, covered bicycle storage within each building;
- Provision of bicycle racks at locations near various buildings within the overall development;
- Changing rooms and shower facilities for bicycle and pedestrian commuters;
- Consultation with Blue Bikes to locate a bike-share facility at the project site;
- Preferential carpool and vanpool parking;
- Sponsored vanpools and subsidized expenses;
- Consideration of preferential parking for low-emission fuel-efficient vehicles and/or electric vehicle charging stations within parking areas;
- Promotional events for transit riders, bicyclists, and pedestrians; and
- Consultation with a car-sharing service, such as Zipcar, to provide vehicles.

Given the phased nature of the development, TDM measures will be expected to be implemented as different uses become active rather than at full occupancy of the site. The phasing program should be clearly defined as part of the TDM program. DOT.5

The Proponent should further work toward identifying the details of these measures as well as developing additional programs. The Proponent should consult with MassRIDES, the Commonwealth's Travel Options provider, and the Assembly Square Transportation Management Association, to help implement the TDM program. DOT.6

Transportation Monitoring Program

The Proponent will be required to conduct an annual traffic monitoring program for a period of five years, beginning six months after occupancy of the Phase I project. It would include:

- Simultaneous automatic traffic recorder (ATR) counts at each site driveway for a continuous 24-hour period on a typical weekday;
- Travel survey of employees and patrons at the site (to be administered by the transportation coordinator);

- Weekday AM and PM turning movement counts (TMCs) and operations analysis at mitigated intersections, including those involving site driveways; and
- Transit ridership counts.

The goals of the monitoring program will be to evaluate the assumptions made in the EENF and the adequacy of the mitigation measures, as well as to determine the effectiveness of the TDM program.

Given the phased nature of the development, the travel survey component of the monitoring program, which should include solicitation of multimodal mode shares to the project site, should commence following completion of the first phase of development. The phasing program should be clearly defined as part of the Transportation Monitoring Program. DOT.7

The Proponent should continue consultation with appropriate MassDOT units, including PPDU, Traffic Operations, and the District 4 Office, as well as the MBTA Service Planning Department. More specifically, the Proponent should work closely with the GLX construction team to ensure appropriate design and construction coordination of the site development and the GLX construction. If you have any questions regarding these comments, please contact me at (857) 368-8862. DOT.8

DOT.1 **Comply with Americans with Disabilities Act (ADA) standards.**

US2 has been meeting regularly with the Massachusetts Bay Transportation Authority (MBTA), the Green Line Extension (GLX) contractor, and the City of Somerville (the "City") and will continue to meet as designs for the MBTA station and development advance in parallel. Accessibility is one of several matters of ongoing coordination and the parties will continue work to ensure that US2's design for D2 and the MBTA's design for Union Square Station provide access to the station that is compliant with both ADA and MBTA design standards. A product of this coordination to date has resulted in the redesign by US2 of the planned civic open space based on MBTA's preference. As a result, a direct, at-grade accessible path from the station to the Prospect Street sidewalk has been planned. The MBTA's material specification will govern the finished condition so as to ensure equal access and ADA requirements for slopes and width will be maintained. Expanded details of US2's GLX coordination efforts have been provided in Section 1.3 of the FEIR. As discussed more fully in the response to comments to the DEIR, the FEIR includes detailed plans of proposed vehicular, pedestrian and bicycle access to Union Square Station, including on Figures 1-8 and 1-9, as well as a discussion of US2's efforts to work with the GLX project team to allow the MBTA to incorporate an elevator into its project. These efforts have included offering to provide, at no cost to the MBTA, easement rights to accommodate an MBTA elevator, and to contribute to the cost of the installation of the MBTA elevator.

DOT.2 **Existing and proposed bicycle facilities in the study area.**

To encourage non-automotive uses, efficient, user-friendly and well-located bicycle parking for both short- and long-term users is important to the success of the Project. Please refer to Figure 1-17 in the FEIR for an overview of Project bicycle infrastructure. Transportation Access Plans, to be provided with each building's Design and Site Plan Review (DSPR) application will coordinate facility locations in demonstration of compliance per the Somerville Zoning Ordinance. Bicycle parking provided by US2 specifically for the MBTA station is currently proposed to be located on the southern end of D2, as shown in Figure 1-21 in the FEIR. Please refer to Section 4.5.4 of the DEIR for a description of additional planned enhancements to bicycle infrastructure.

DOT.3 **Mitigation measures to enhance transit service to the site.**

US2 is committed to working with all parties, particularly the City and the MBTA, to ensure transit access to Union Square as part of larger overall goals of minimizing auto travel and meeting or exceeding mobility management requirements. While the MBTA controls improvements to their system, US2 has committed to providing the following in support of Union Square Station:

- US2 will contribute approximately $5.8 million to support the GLX project.
- US2 will provide on the D2 property improvements to the Union Square Station including the following end of line facilities: operator's breakroom, accessible restrooms, janitor's closet, and The Ride paratransit service drop-off area.
- A permanent easement in favor of the MBTA, for construction and operation, a portion of the GLX Union Square Station on a portion of the D2 site.
- ADA pedestrian path from Union Square Station to the Prospect Street sidewalk to improve pedestrian access to transit.

The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts. The City has both the ability and the willingness to attempt additional interventions to benefit transit. To fund these potential improvements, the City will allocate a portion of US2's committed offsite infrastructure and future phase contribution monies to rapid-response, short-term mobility and safety retrofits in the Project area to use as deemed necessary. In addition, through the individual plans for each Lot, US2 will work with the City on potential transit improvements proximate to each Lot. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger operations within Union Square and will be used to help determine future improvements or the success of ones previously implemented.

Section 2.5 of the FEIR provides specific transportation metrics that would suggest when modifications to the transportation system could be implemented to improve the MBTA's bus network, and what those modifications could be. To fund these potential improvements, the Project will allocate a portion of committed offsite infrastructure and future phase contributions to rapid-response, short-term mobility and safety retrofits in the Project area.

DOT.4 MBTA Corporate Pass Program.

US2 has joined the MBTA Perq Program (the MBTA transit pass program for companies) and at the request of the Union Square Neighborhood Council, US2 agrees that as part of its leases to companies greater than 50 employees, US2 shall require the lessee to participate in the MBTA Perq program (or propose some equivalent substitute) as part of the lessee's transportation demand management obligation so long as MBTA Perq continues to exist and without substantial changes.

DOT.5 Phasing program.

As described in Section 4.5.7 of the DEIR, and further discussed in the FEIR, the Project will complete individual Mobility Management Plans (MMPs) for each Lot as part of the

DSPR permitting process, rather than by phase. The MMP programs and policies will generally be consistent across all Lots, as well as the Project as a whole. A monitoring program will be established allowing for ongoing review of consistency with the goals, and steps to achieve the 60% non-auto mode share through improvements in non-auto travel or program adjustments as needed to meet ongoing goals.

As there will be multiple tenants located within the Project site and within each Lot, MMP obligations will be included to the extent possible as part of the lease language between tenants and the property owner. Verification of the ongoing conformance with this condition will be provided to the City by the property owner either as a copy of the leases (with financial aspects and other non-MMP elements redacted) or via an affidavit signed by the owner and tenant(s) verifying that this language was included and agreed to in the lease. This documentation will be provided to the City prior to the issuance of the Certificate of Occupancy for tenant spaces with 50 or more employees. The proposed programs and services have been developed in service of the standards set forth in Union Square Zoning as adopted June 2017, and in response to the City's requirements from the Coordinated Development Special Permit (CDSP), as well as comments received on the ENF.

The Project team will work with the City and/or future owners, employers and tenants to implement the measures outlined in the MMPs. These programs and services may be refined from time to time to improve program efficiency or performance.

As described in Section 4.5.8.3 of the DEIR, based on the findings from the Annual Travel Survey and the most recent set of biennial counts, building management will submit a Mobility Status Report annually to the City. Depending on progress toward meeting the stated mode split goal and as evidenced by annual reporting, additional programs and services may be considered.

DOT.6 **TDM program coordination.**

On March 25, 2019, US2 spoke with representatives from the Assembly Row Transportation Management Association (TMA) and learned about their ongoing efforts to create the Assembly Row TMA and provide TMA services for the Assembly Row district. The parties agreed to connect again later this year after construction has started on the Project to continue the dialogue. The goal of this coordination will be to share best practices, discuss challenges and identify synergies. US2 will continue to consult with MassDOT and the Assembly Square TMA as it implements the Union Square Transportation Demand Management (TDM) program. US2 will also contact MassRIDES to discuss the Project's TDM program.

DOT.7 **Monitoring program.**

US2 commits to initiating the travel survey component of the annual monitoring program following the completion of the first phase of development. The phasing of mitigation, including transportation mitigation, is described in Section 1.2.3.1 and Table A in Chapter 5 of the FEIR.

DOT.8 **Consult with appropriate MassDOT units.**

US2 has continued to consult with MassDOT, the MBTA and other divisions as appropriate, directed and described above. Further consultation and coordination with appropriate MassDOT units is also discussed in the FEIR.

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENERGY RESOURCES
100 CAMBRIDGE ST., SUITE 1020
BOSTON, MA 02114
Telephone: 617-626-7300
Facsimile: 617-727-0030

Charles D. Baker
Governor

Karyn E. Polito
Lt. Governor

Matthew A. Beaton
Secretary

Judith F. Judson
Commissioner

21 August 2018

Matthew Beaton, Secretary
Executive Office of Energy & Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02114
Attn: MEPA Unit

RE: Union Square Redevelopment, Somerville, Massachusetts EEA #15889

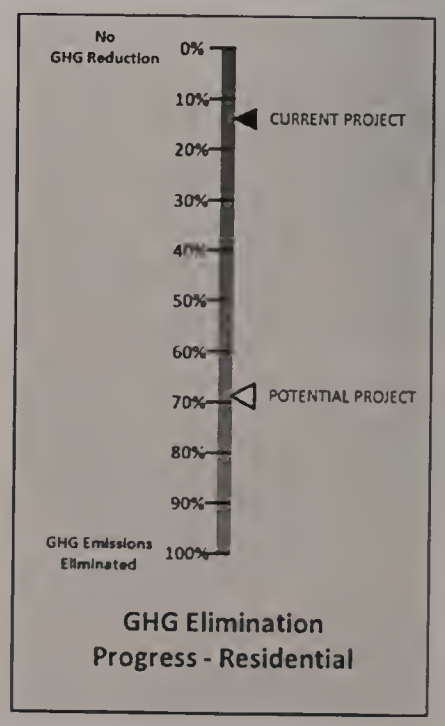
Cc: Maggie McCarey, Energy Efficiency Director, Department of Energy Resources
Judith Judson, Commissioner, Department of Energy Resources

Dear Secretary Beaton:

We've reviewed the Environmental Notification Form (ENF) for the above-referenced project. This phase of the project consists two parts: (a) 450 units of multifamily (399,000-sf) with ground-floor retail; and (b) a 200,000-sf office. Key findings are as follows:

Multifamily:

- Currently-planned emissions reduction is 14%. This could be improved to 68% with Passivehouse, largely eliminating emissions.
- Passivehouse has attractive affordability: residents' annual utility costs would be reduced $2,100 (70% less). Over ten years, residents would save about $10M.
- With Passivehouse, the developer would be eligible for up to $1.3M in Alternative Energy Credits plus other incentives from the utility and Massachusetts Clean Energy Center.

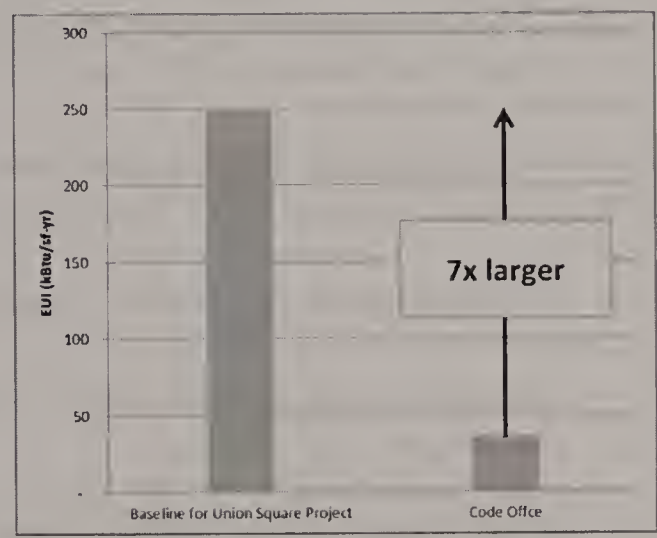


Office:

- The office portion of the project has an energy consumption that is about seven (x7) larger than the energy consumption one would expect for a code-built office (250 kBtu/sf-yr versus 36 kBtu/sf-yr). See illustration below. This appears to be related to the assumption that 60% of the floor area is assumed to contain laboratory uses with large ventilation loads.

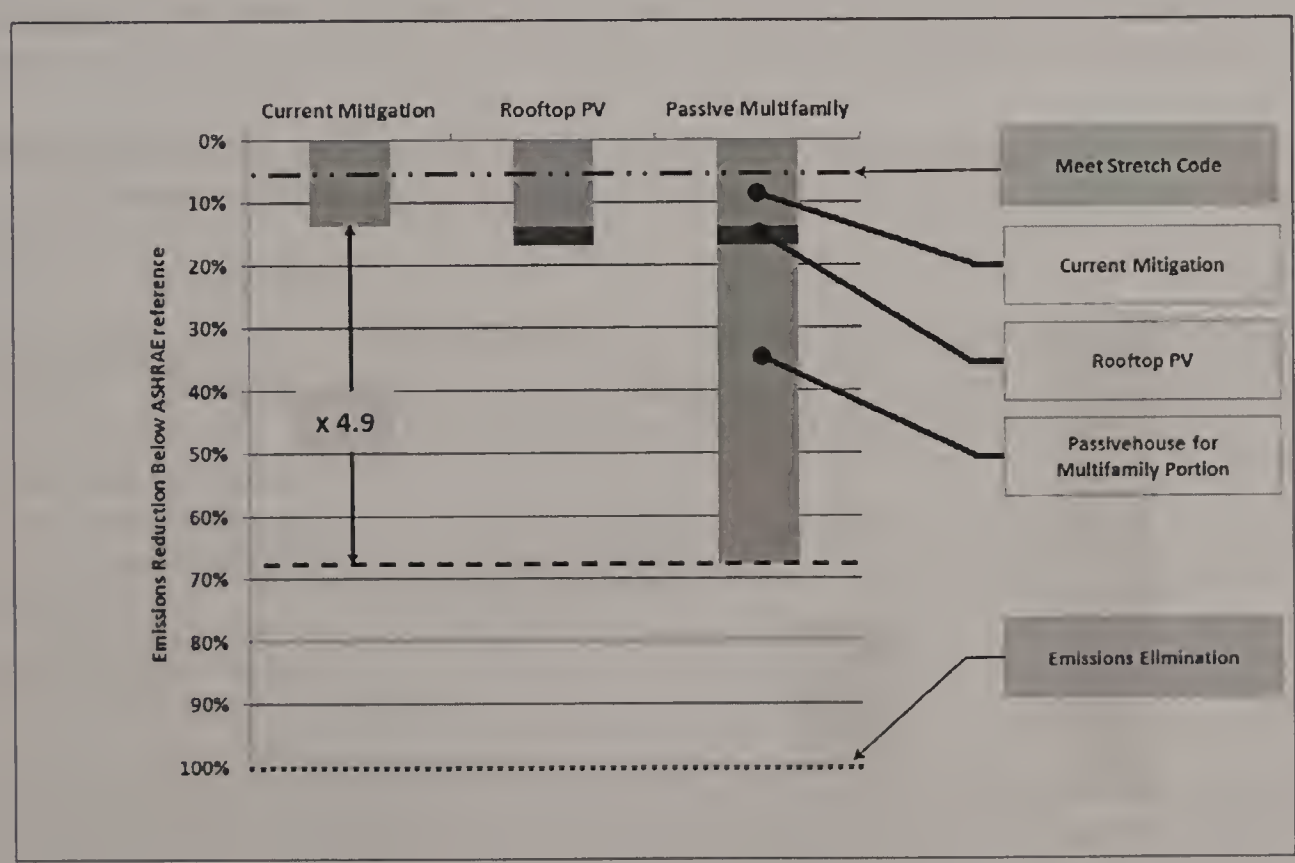
- Currently-planned emissions reduction relies on laboratory-use. In addition, envelope performance is being reduced, trading off envelope performance in anticipation of lab use. (Planned envelope is 13% lower-performing than prescriptive code.)

- It is preferable that building mitigation not be laboratory-use dependent and vertical envelope performance should be set to at least code performance.



Pathway to 68% Emissions Reduction for the Multifamily

Passivehouse appears to provide the best opportunity for emissions reduction. PV on the rooftop would provide an additional benefit, as well. Together, mitigation could be increased by about almost a factor of 5, from currently planned 14% to 68%. In summary, Passivehouse plus solar PV on the roofs would make great strides toward eliminating emissions for this project.



Passivehouse – Affordable and Resilient

Passivehouse is also affordable and resilient. Average unit utility cost would be reduced from $2,800/yr to $700/yr, saving each unit about $2,100/yr. Across all units, these Somerville residents would be saving about $10M in the first decade.

Passive multifamily usually costs more to build than code multifamily. An extensive study by NYSERDA for a similar urban-setting residential multifamily tower found that Passivehouse improvements cost about $8.88/sf more to build.

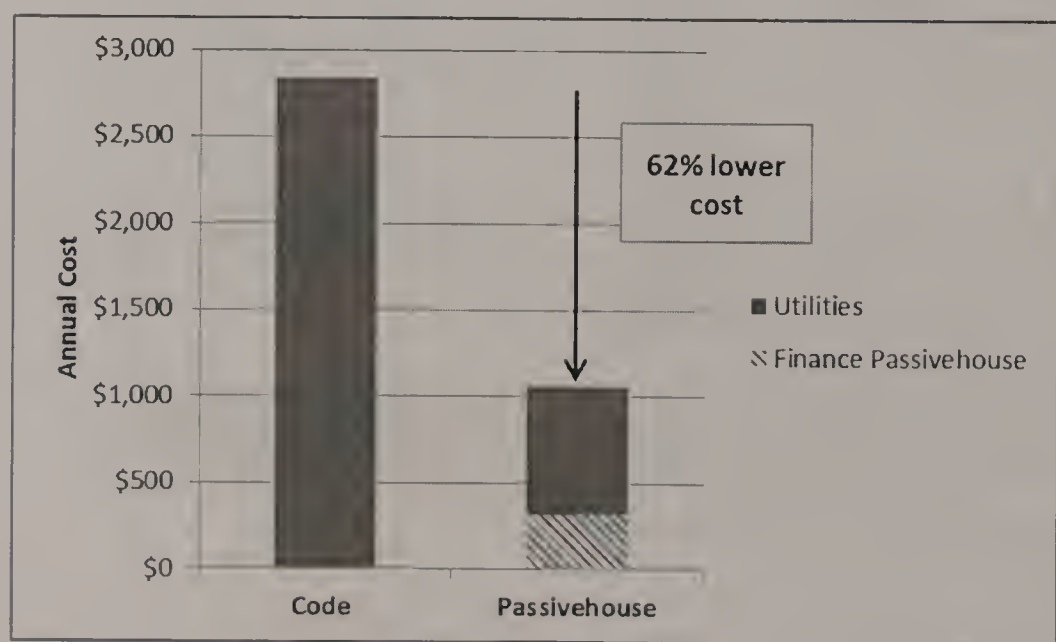
Massachusetts uniquely provides large incentives that a Passivehouse multifamily would quality for which would reduce costs. These include:

- Alternative Energy Credits, value of up to approximately $1.35M.
- MassSave performance-based utility incentives for high-rise multifamily (to be determined by the utility)
- Massachusetts Clean Energy Center (MCEC) grants: up to $0.25M

Netting against the above incentives, Passivehouse multifamly would have a payback in under 3 years.

If the units are planned to be sold as condominiums, Passivehouse would actually cost the buyers more than 60% less to own and operate from "day 1" as follows:

- Referencing the illustration below, the average multifamily unit built to Code costs about $2,800 per year for utilities.
- In contrast, a Passivehouse unit costs about $1,000 per year for utilities (about $700 for utilities and $300 to finance the Passivehouse improvements, netting incentives).



Based on:

- 5% cost of financing. 30 year term
- $8.88/sf for Passivehouse premium cost per NYSERDA
- Value of Alternative Energy Credits and MCEC incentives

The above does not consider tax implications which would further improve affordability. Passivehouse converts a utility liability into a tax-advantaged asset. The above also does not include utility incentives. (These need to be determined by the utility.)

If the units are planned to be rental units, various models exist for the building owner to profit which address "split incentive". For example, the building owner charges rental rates that include space condition (heating, cooling, and hot water, for example), benchmarking the rental premium to Code-built apartment performance. In turn, the owner would actually be paying only a fraction of this premium, resulting in profit.

Passivehouse also provides other attractive benefits to future tenants or buyers, including:

- Noise reduction
- Indoor air quality improvements
- Comfort improvements
- Higher quality doors and windows

Passivehouse would also greatly improve resiliency as Passivehouse units can stay warm (or cool, in summer) for extended periods even with loss of active space conditioning equipment.

Office

As noted above, the office component of the project assumes that 60% of the floor area is laboratory use. The assumption is potentially problematic, as follows:

- Current mitigation level (12%) relies heavily on the large ventilation that would occur with laboratory use. If the laboratory use does not materialize to the extent assumed (now or in the future), the level of mitigation will diminish.

- The building envelope performance is being traded away in anticipation of having large ventilation loads. Envelope performance, therefore, relies on tenant mix, now and in the future.

- The proponent ran several analysis to show how higher performing envelope would improve mitigation, coming to conclusion that envelope performance has little effect. This conclusion is only valid under the conditions of high ventilation loads.

In summary, mitigation should rely less on tenant mix (lab vs. office) and more on fixed improvements that can be implemented by the proponent. Further, envelope performance should not be compromised.

Rooftop Solar PV

A thorough analysis of rooftop solar PV was provided, identifying about 25,000 sf suitable for rooftop solar (250 kW). We recommend implementation of 250 kW of solar PV on this project.

CHP

Similarly, a thorough analysis of CHP was provided. Various CHP sizes were investigated, ranging from 75 kW to 250 kW in size, all having payback of less than 3 years. We recommend implantation of CHP with size to be determined as the project develops.

Recommendations for Future Submissions

Our recommendations for future submissions are as follows:

1. Passive design for the residential portions of the project should be thoroughly evaluated. DOER.1

   As part of Passive evaluations, we recommend that a thorough investigation be performed for: Alternative Energy Credits, utility benefits, MCEC grants, and other incentives. We recommended meeting with the utilities to confirm incentive level, including incentives for the high performance enabled by Passivehouse.

2. For the office and retail reduced envelope performance due to excessive windows and curtain walls should be avoided. DOER.2

3. For the office analyses, laboratory use should be assumed to be zero. Mitigation should be shown to be independent of this tenant use. DOER.3

4. Rooftop PV and CHP should be incorporated in the project. DOER.4

Sincerely,

Paul F. Ormond, P.E.
Energy Efficiency Engineer
Massachusetts Department of Energy Resources

DOER.1 **Passive design for the residential portion of the Project.**

Passive House is a building standard for ultra-low energy buildings that focuses on air tightness and a super-insulated building enclosure. Passive House principles are proposed in current designs across the Project. The FEIR contains a thorough Passive House Analysis of the mid-rise multi-family residential and hotel buildings. Please refer to Section 3.4 and Appendix E of the FEIR for details. This study demonstrated that Passive House can produce energy benefits, but also comes at significant cost and risk given the nascent market. Through the MEPA process, US2 has come to understand the importance of establishing a Passive House market to the state, the City and the Somerville community. As such, despite the cost and risks associated with the design and construction of a Passive House building, US2 has committed to building D4.3 as a Passive House multi-family project. In addition, US2 will consider Passive House for future residential buildings in the Project. Please refer to Section 3.4 of the FEIR for details.

DOER.2 **Reduced building envelope.**

Section 7.2.2.2 of the DEIR provided a discussion of building envelopes, and noted that all buildings included a window to wall ratio of 40% or less (it should be noted that the DEIR erroneously reported that the window to wall ratio for D2.2-2.3 was 45%, instead of the actual 40% modeled).

As noted and further discussed in Section 3.2 of the FEIR, all buildings have proposed building envelopes that exceed prescriptive code levels.

DOER.3 **Laboratory use.**

Chapter 7 of the DEIR included a comprehensive discussion of the implications of modeling lab space versus office space. In order to be conservative and as to not take credit for lab ventilation energy savings that may not ultimately be built, Model Groups 2, 3 and 4 have been modeled as office buildings. This remains true in the FEIR analysis.

DOER.4 **Rooftop PV and CHP.**

Section 7.2.3.2 of the DEIR included a discussion of combined heat and power (CHP), and concluded that CHP will continue to be evaluated for D1.1, D2.1, D2.2-2.3 and D3.2, as the preliminary analysis shows that CHP may be economically feasible for these buildings. Ultimately, the analysis demonstrated that a potential CHP system would not be as effective in achieving the Project's greenhouse gas (GHG) reduction goals as the high-efficiency systems that have been proposed. In addition, US2 does not want to

commit the buildings to fossil-fuel burning CHP systems when electric alternatives may be available.

Section 7.2.3.2 of the DEIR also included an analysis of solar PV. The feasibility of incorporating solar PV will depend on the design of the buildings and the availability of incentives. US2 has been working with Solect Energy to study the solar potential of the Project and to advise the developer of solar opportunities and considerations early in the planning process. Solect has identified solar-ready zones on many of the Project rooftops where it makes the most sense to locate future photovoltaic installations. Rooftop areas may be aggregated over time to take advantage of scale. US2 intends to work with third-party solar providers to convert as much of the set-aside area as possible to functional solar fields over the course of Project implementation. Please refer to Section 3.5 of the FEIR for additional information.

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

August 24, 2018

Matthew A. Beaton, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Somerville
Union Square Redevelopment
EEA # 15889

Attn: MEPA Unit

Dear Secretary Beaton:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the Environmental Notification Form (ENF) for the Union Square Redevelopment in Somerville, submitted by Union Square RELP Master Developer LLC (US2) and the Somerville Redevelopment Authority (SRA). The overall redevelopment, which is part of a state-approved urban revitalization plan, includes approximately 15.7 acres of land spread out over seven parcels identified as "D Parcels 1-7". The proposed project includes the construction of approximately 2,397,000 square feet of commercial, residential, retail, arts, and creative economy uses as well as new open spaces and parking. The Department provides the following comments.

Wastewater

The wastewater design flow for the proposed project is 286,834 gallons per day using the design flows in Title 5 (314 CMR 15.203), although the ENF also suggests that only 50% of the Title 5 estimates be used as an indicator of average daily flows. The final design flow for the project will be subject to the approval of the City of Somerville Engineering Department, and should conform to their sewer use ordinance and past practices in defining design flows. Since in either event, the design flows will be well in excess of 15,000 gallons per day, MassDEP regulations

This information is available in alternate format. Call Michelle Waters-Ekanem, Diversity Director, at 617-292-5751. TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

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require that the City, as the sewer authority, imposes a requirement on the project proponent to provide for removal of four gallons of infiltration and inflow for each gallon of new wastewater design flow to be connected to the sewer system. The ENF indicates that the project will involve removal of stormwater from the sewer system, but does not indicate the scope of that mitigation work nor quantify the volume of stormwater to be removed. The project proponent shall work with City staff to ensure that the 4:1 removal requirement is met. DEP.1 DEP.2

Hazardous Waste/ Massachusetts Contingency Plan/M.G.L. c.21E

The project is proposed to be developed in three phases, with a waiver of MEPA approval requested for Phase 1, which includes 3.5 acres associated with the majority of the D2 block. The Proponents are seeking a waiver of Phase 1 in order to allow for the conveyance of the D2 block from SRA to US2, so construction on the Phase 1 portion of the project can begin prior to the completion of the full MEPA review.

The project area has been used historically for a combination of industrial, commercial, and residential uses. Past uses have resulted in the release of oils and hazardous materials to the soil and groundwater. The contamination includes polychlorinated biphenyls (PCBs), metals, petroleum hydrocarbons, and polyaromatic hydrocarbons (PAHs) in soil. Chlorinated volatile organic compounds have been detected in the groundwater on a small portion of the Phase 1 Project area. The entire project area includes a total of 26 Release Tracking Numbers (RTNs), with the Phase 1 Project area containing 17. In order to manage the 17 RTNs already assigned in the Phase 1 Area, the Proponent proposes to work with MassDEP to complete the necessary work under one master RTN. The Proponent will also work with EPA in order to comply with the Toxic Substances Control Act (TSCA) and the federal regulations under 40 CFR 761.

There is presently one Activity and Use Limitation (AUL) within the Phase I Area, and one AUL outside the Phase 1 Area. The AUL within the Phase 1 Area is at 26 Bennett Street (RTN 3-29452) and is associated with the former Prospect Iron and Steel. This AUL will be retracted as additional site remediation and improvements are proposed at this property and the adjacent Kiley Barrel site. The AUL outside the Phase 1 Area is for 9 Union Square (RTN 3-32294), and covers an approximate area of 21,000 square feet. The Project design will maintain the obligations stated in that AUL.

Approximately one-quarter of the Phase 1 Project site is the Former Kiley Barrel Disposal Site (RTN 3-2849), which is located at the corner of Somerville Avenue and Prospect Street. Cleanup at the Kiley Barrel Site has been conducted TSCA due the presence of PCBs greater than 50 mg/kg, as well as the Massachusetts Contingency Plan (MCP). The remediation included soil removal to three feet below grade, and the installation of a three-foot soil and gravel cap. The site is subject to final closure and the filing of an AUL in the future. Low levels of CVOC's are present in the southeastern corner of the Kiley Barrel Site, and the SRA is planning an in-situ groundwater treatment and monitoring program. Based on the effectiveness of the in-situ treatment program, a vapor mitigation system may be installed in buildings constructed on this portion of the Phase 1 Project Site.

Based on site investigations, the remaining portion of the Phase 1 Project site is contaminated with PCBs, metals, petroleum hydrocarbons, and PAHs in soil. Concentrations of PCBs greater than 50 mg/kg were identified in certain locations; therefore, the site will be cleaned up in accordance with both TSCA and the MCP. Additional site characterization will be performed to delineate the extent and volume of PCB contaminated soil on portions of the Phase 1 Project site. A cleanup plan and notification will be submitted to the US EPA for approval, and appropriate MCP response action reports will be submitted. The cleanup will include excavation and off-site disposal of contaminated soils greater than applicable standards. Residual soil contamination will be addressed, and the feasibility of approaching background will be evaluated as well as capping with new site construction. The proposed Phase 1 development plan intends to minimize the areas of significant underground space or parking in order to reduce the volume of contaminated soils to be excavated. The anticipated timeframe for beginning remedial design is, at the earliest, Summer to Fall of 2018.

Contaminated Soil and Groundwater:

The project proponent is advised that excavating, removing and/or disposing of contaminated soil, pumping of contaminated groundwater, or working in contaminated media must be done under the provisions of MGL c.21E (and, potentially, c.21C) and all other applicable federal, state, and local laws, regulations, and bylaws. If permits and approvals under these provisions are not obtained beforehand, considerable delays in the project can occur. The project proponent cannot manage contaminated media without prior submittal of appropriate plans to MassDEP, which describe the proposed contaminated soil and groundwater handling and disposal approach, and health and safety precautions. If contamination at the site is known or suspected, the appropriate tests should be conducted well in advance of the start of construction and professional environmental consulting services should be readily available to provide technical guidance to facilitate any necessary permits. If dewatering activities are to occur at a site with contaminated groundwater, or in proximity to contaminated groundwater where dewatering can draw in the contamination, a plan must be in place to properly manage the groundwater and ensure site conditions are not exacerbated by these activities. A Licensed Site Professional (LSP) must be employed or engaged to manage, supervise or actually perform the necessary response actions at the site. DEP.3

Air Monitoring:

Dust and/or vapor monitoring and controls are often necessary for large-scale projects in contaminated areas. The need to conduct real-time air monitoring for contaminated dust and to implement dust suppression must be determined prior to excavation of soils, especially those contaminated with compounds such as metals and PCBs. An evaluation of contaminant concentrations in soil should be completed to determine the concentration of contaminated dust that could pose a risk to health of on-site workers and nearby human receptors. If this dust concentration, or action level, is reached during excavation, dust suppression should be implemented as needed, or earthwork should be halted. DEP.4

Ambient air monitoring should be conducted at the site perimeter and near areas of excavation, stockpiling, and movement of soils contaminated with volatile organic compounds such as trichloroethylene (TCE). Ambient air monitoring should be implemented using field instrumentation capable of detecting low concentrations of TCE (ex: 1 ppbV TCE). A detailed air monitoring plan should be developed prior to excavation activities to include monitoring frequency, action levels, sampling the indoor air of nearby structures, as needed, and mitigation measures. DEP.5

Capping of Contaminated Soil:

If capping of contaminated soil is needed to achieve a level of No Significant Risk, MassDEP recommends the following capping design criteria. In unpaved areas, a minimum of three feet of clean soil should be placed over the contaminated soil. This protective layer of clean soil should be separated from the underlying contaminated soil by a geotextile or combination of materials, which will provide both a brightly colored visual marker and a permeable fabric to separate the clean soil from the contaminated soil. In paved areas, a minimum one-foot cap consisting of clean soil, road base and the pavement layer should be placed over the contaminated soil. Similar to unpaved areas, the contaminated soil should be separated from the clean soil or road base using a visual marker and geotextile. In such cases, an Activity and Use Limitation (AUL), prepared in accordance with 310 CMR 40.1012 would be necessary to identify the maintenance requirements of the cap. It should also be noted that a cap constructed as an Immediate Response Action or a Release Abatement Measure will not be considered a Permanent Solution until a Phase III completed in accordance with 310 CMR 40.0850 demonstrates the lack of a feasible alternative, as required by 310 CMR 40.0414(7) and 40.0442(4). DEP.6

Potential Indoor Air Impacts:

Parties constructing and/or renovating buildings in contaminated areas should consider whether chemical or petroleum vapors in subsurface soils and/or groundwater could impact the indoor air quality of the buildings through vapor intrusion. All relevant site data, such as contaminant concentrations in soil and groundwater, depth to groundwater, and soil gas concentrations should be evaluated to determine the potential for indoor air impacts to existing or proposed building structures. Particular attention should be paid to the vapor intrusion pathway for sites with elevated levels of chlorinated volatile organic compounds such as tetrachloroethylene (PCE) and trichloroethylene (TCE). MassDEP has additional information about the vapor intrusion pathway on its website at https://www.mass.gov/lists/policies-guidance-technical-support-for-site-cleanup?_ga=2.165003519.1902262297.1534291448-758575996.1534291448#vapor-intrusion-. DEP.7

New Structures and Utilities:

Construction activities conducted at a disposal site shall not prevent or impede the implementation of likely assessment or remedial response actions at the site. Construction of structures at a contaminated site may be conducted as a Release Abatement Measure if assessment and remedial activities prescribed at 310 CMR 40.0442(3) are completed within and adjacent to the footprint of the proposed structure prior to or concurrent with the construction activities. Excavation of contaminated soils to construct clean utility corridors should be conducted for all new utility installations. DEP.8

Activity and Use Limitations:

An Activity and Use Limitation (AUL) is a legal document that is recorded or registered at the appropriate Registry of Deeds and identifies site conditions that are the basis for maintaining a condition of No Significant Risk at a property where contamination remains after a cleanup. The AUL identifies permitted and allowable site uses and activities that may occur at a property while maintaining No Significant Risk. The AUL also identifies restricted uses and activities, which could result in the exposure of people at or near the disposal site to remaining contamination if such activities were to occur. The project proponent is advised that in cases where proposed activities would not be consistent with a level of No Significant Risk and/or an existing AUL, additional cleanup and the amendment or termination of the initial AUL and implementation of a revised AUL would be necessary before the proposed activities could occur. DEP.9

ADDITIONAL COMMENTS FOR ALL PHASES

- Prior to conducting Comprehensive Response Actions at a site that was previously Tier Classified, the project proponent must file either a Tier Classification Extension and Transfer Submittal pursuant to 310 CMR 40.0560(7) and (8), respectively, or a Revised Tier Classification Submittal pursuant to 310 CMR 40.0570. If the project proponent is an Eligible Person, filing a Revised Tier Classification Submittal pursuant to 310 CMR 40.0570 is required to re-establish response action deadlines at the site, and must be provided within 120 days of becoming an owner or operator of the site, unless MassDEP agrees to a later date. An Eligible Person is defined as an owner or operator who did not own or operate the site at the time of the release and who did not cause or contribute to the contamination at the site. M.G.L. c.21E § 5C describes the liability exemption of an Eligible Person and provides the criteria necessary to qualify for such exemption. DEP.10

- Prior to the installation of new utilities in public rights-of-way, utility easements, and/or private property, the identification of existing disposal sites or suspected areas of contamination at locations in proximity to the proposed utility work should be completed. Pre-characterization of soil and/or groundwater in the areas of proposed utilities should be conducted to determine the scope and expense of necessary mitigative actions. This pre-characterization work will help determine the need for Utility-Related Abatement Measures, and expedite the implementation of necessary utility installation work. The general provisions for Utility-Related Abatement Measures are listed in the MCP at 310 CMR 40.0461. DEP.11

- In total, the project will create 3.5 acres of open space, with the largest concentration provided by way of a new 0.61 acre Neighborhood Park planned for development in block D1. Accessible soils at disposal sites where parks and recreation areas are proposed should be carefully investigated in order to determine the nature and extent of contamination so appropriate evaluations can be made regarding the need for either further remediation or capping. DEP.12

- In areas proposed for development for which no releases have been previously reported to the MassDEP, appropriate historical evaluations, and if necessary follow up soil and groundwater DEP.13

investigations, should be implemented to ensure that no contamination exists. For instance, the D-3 Block was the former location of Union Glass Works that manufactured a full line of flint glass products from 1854-1924. Traditionally, flint glasses were lead glasses containing around 4-60% lead (II) oxide. The manufacture and disposal of these glasses on site may have released lead contamination to the environment.

- The following Immediate Response Actions (IRA) have not been completed within the Phase 1 Area including: 1) RTN 3-30850 – 51 Allen Street; 2) RTN 3-31024 – 27 Bennett Street; 3) RTN 3-31025 – 26-28 Prospect Street; and 4) RTN 3-30510 – 15 Bennett Street. Once US2 purchases the Phase 1 Area, as Owner of the site, they must continue Immediate Response Actions and submit IRA Status Reports and IRA Completion Statements for the IRA's listed above.in accordance with 310 CMR 40.0410. DEP.14

- In order to manage the multiple RTN's in the Phase 1 area, the Proponent is proposing to conduct response actions under one master RTN. Managing response actions and MCP deadlines for multiple disposal site RTNs may be accomplished through the application of a Special Project Designation Permit in accordance with 310 CMR 40.0060. DEP.15

The MassDEP Northeast Regional Office appreciates the opportunity to comment on this proposed project. Please contact Joanne.Fagan@state.ma.us at (978) 694-3390 for further information on MCP/Hazardous Waste issues. If you have any general questions regarding these comments, please contact me at John.D.Viola@state.ma.us or at (978) 694-3304.

Sincerely,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Steve Johnson, Joanne Fagan, MassDEP-NERO

DEP.1 **Infiltration and inflow.**

US2 met with representatives of the City's engineering department to discuss the 4:1 infiltration and inflow (I/I) mitigation policy and its application to the Project. Coordination with the City will continue throughout the development of the Project in order to ensure that I/I mitigation requirements are met.

DEP.2 **Volume of stormwater to be removed from the sewer system.**

Each Lot will include stormwater management measures to mitigate peak rates of runoff, water quality measures, detention/infiltration facilities, as is feasible and practicable, in accordance with the Massachusetts Stormwater Management standards to the maximum extent practicable.

Stormwater detention and infiltration facilities, where feasible and practicable, will be incorporated into the design of each Lot to reduce the rate and volume of stormwater discharged from the development for all storms up to and including the 100-year storm event. Reducing the rate and volume of stormwater discharge will reduce the demands on the existing infrastructure and will help reduce the extent and duration of surcharging in the City's infrastructure during intense storm events.

Currently, US2 does not have ownership of the remainder of the parcels and cannot legally access them to perform investigations of subsurface conditions. Upon acquiring each parcel, investigations will be performed to determine soil conditions and groundwater elevations that will allow pre-development hydrology analyses and for the design of appropriate stormwater management systems that will reduce peak rates of runoff and runoff volumes, if feasible.

The reduction in peak runoff rates from each Lot will benefit the local stormwater infrastructure. The City's installation of the 14-foot by 6-foot box culvert adjacent to D1, D2 and D6 in Somerville Avenue represents a significant improvement in the ability of the City's infrastructure to store stormwater and reduce the magnitude and extent of surcharging events in the Union Square area.

DEP.3 **Removal of contaminated soil.**

Comment noted. Chapter 8 of the DEIR included information regarding site conditions and plans to achieve a level of No Significant Risk. Specifically, the assessment and remediation approaches are outlined for each Block in the following sections: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7 Block: 8.8.3. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence.

The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. Additional regulatory considerations are also provided in Section 8.10 of the DEIR.

US2 intends to perform environmental assessments including subsurface investigations at each of the Lots prior to acquisition. As new data are obtained, and/or new conditions are encountered, this information will be incorporated into the applicable regulatory submittals and used to evaluate risks to health, safety, public welfare, and the environment. The additional environmental assessment data will be evaluated in connection with any existing data and incorporated into the applicable construction Release Abatement Measure (RAM) Plans that will be submitted to MassDEP, as required, prior to construction. RAM Plans will include provisions for perimeter dust and/or air quality monitoring, if warranted based on the data, to protect against contaminant migration. Additionally, redevelopment activities will be performed in accordance with all applicable local, state, and federal regulations.

DEP.4 **Air monitoring for contaminated dust.**

The RAM Plans will outline monitoring requirements anticipated during construction. Specific monitoring requirements will vary depending on subsurface conditions. In each case, site-specific air monitoring thresholds will be developed based on the concentrations detected in soil and considering potential exposure of workers and the general public. Air monitoring requirements typically include dust monitoring and volatile organic compound (VOC) monitoring, depending on the contaminants of concern (COCs). While a specific monitoring program will be developed for each RAM, dust monitoring typically includes the deployment of perimeter dust monitors capable of logging dust levels in real time. If work will be performed in an area where elevated VOCs are present in the subsurface, perimeter and work zone photoionization detectors (PIDs) can be used to monitor the relative concentration of VOCs. The RAM Plan will specify concentrations, or action levels, which will trigger the need for mitigation. These actions may include dust suppression or other mitigation measures, including work stoppage, to be taken by the contractor in real time.

DEP.5 **Ambient air monitoring.**

Comment noted. Please see response to comment DEP.4 above.

DEP.6 **Capping criteria.**

Chapter 8 of the DEIR discussed the anticipated approaches to achieve a level of No Significant Risk on applicable sites. Specifically, the assessment and remediation approaches were outlined for each Block in the following sections: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7 Block: 8.8.3. For each D Block, a specific strategy will be developed based on the

available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. The remediation strategies will likely include a combination of soil excavation and disposal, soil and groundwater remediation, and/or the use of protective barriers such as three feet of clean soil, pavement, or a building foundation with the implementation of an AUL. The barrier will be separated from the underlying layers by a geotextile or other similar material to provide a visual marker and to separate the upper clean materials from the lower contaminated soil. In paved or hardscaped areas, the barrier will be a minimum of one-foot thick consisting of clean soil, base material and the pavement or concrete surface finish. Use of protective barriers to achieve and maintain a level of No Significant Risk will require the recording of an Activity and Use Limitation (AUL) that demonstrates where the barriers are located and describes the required maintenance of the barrier. In cases where existing AULs are present, construction will be performed in a manner that is consistent with the AULs. Additional regulatory considerations were also provided in Section 8.10 of the DEIR.

DEP.7 **Indoor air impacts.**

Section 8.10 of the DEIR included information about indoor air impacts. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. Vapor intrusion assessments will be performed for each proposed building in the Project. Specific attention will be given to properties where releases of VOCs, and more specifically chlorinated VOCs (CVOCs), have occurred.

DEP.8 **Excavation of contaminated soils to construct clean utility corridors.**

Chapter 8 (specifically, page 8-13) of the DEIR discussed measures related to the construction of utility corridors. It is expected that future development will require soil management, including the excavation and off-site reuse or disposal of soil to a permitted facility. This would apply, as needed, to the construction of future buildings and on-site utilities. New on-site utilities will be constructed with a clean utility corridor (i.e., impacted soils will be excavated and replaced), unless prior remediation has already created clean corridors.

DEP.9 **Activity and Use Limitation.**

Comment noted. Section 8.10 of the DEIR included information regarding approaches to achieve a level of No Significant Risk and the potential need to amend or create AULs. As noted above, US2 intends to perform environmental assessments including subsurface investigations at each of the Lots prior to acquisition. As new data are obtained, and/or new conditions are encountered, this information will be incorporated

into the applicable regulatory submittals and used to evaluate risks to health, safety, public welfare, and the environment.

DEP.10 **Revised Tier Classification Extension and Transfer.**

Section 8.3.3 of the DEIR included information about the plan regarding Comprehensive Response Actions. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will include re-establishing MassDEP timelines and will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk.

DEP.11 **Identify existing disposal sites or suspected areas of contamination at locations in proximity to the proposed utility work.**

Identification of existing disposal sites and suspected areas of contamination will be done prior to utility work. It is expected that future development will require soil management, including the excavation and off-site reuse or disposal of soil to a permitted facility. This would apply, as needed, to the construction of future buildings and on-site utilities. New on-site utilities will be constructed with a clean utility corridor (i.e., impacted soils will be excavated and replaced), unless prior remediation has already created clean corridors.

DEP.12 **Investigate the accessible soils in proximity to the proposed parks and recreation areas for contamination.**

As discussed in Section 8.10 of the DEIR, all sites that include parks and recreation areas will be analyzed as required, and if needed, remediation or capping will occur. In the locations of these proposed open spaces, assessment of soil conditions will be performed to evaluate the suitability of the soil for use in an open space. In some instances, and depending on the data collected, remediation or use of a clean soil cap may be required to achieve a level of No Significant Risk for users of these open spaces

DEP.13 **Conduct appropriate historical evaluations, and if necessary follow up soil and groundwater investigations.**

Proper evaluations and soil and groundwater investigations, if necessary, will be completed on all sites prior to construction. Specifically, the assessment and remediation approaches are outlined for each Block in the following sections: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7 Block: 8.8.3. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk.

DEP.14 **Complete Immediate Response Actions (IRA) that have not been completed within the Phase I Area.**

Section 8.3.3 of the DEIR included the plan for actions that will be completed for the development of D2.

DEP.15 **Special Project Designation Permit application.**

Comment noted.

Strysky, Alexander (EEA)

From: Kirby, Christine (DEP)
Sent: Friday, August 24, 2018 9:06 AM
To: Strysky, Alexander (EEA)
Cc: Viola, John D. (DEP)
Subject: Union Square Development - EEA No. 15889

These comments supplement the comments submitted by MassDEP's Northeast Region on the Union Square Development Project in Somerville (EEA No. 15889).

Air Quality Analysis:

The Expanded ENF included an analysis and supporting information on project-related air quality and GHG emissions impacts. The mesoscale analysis was used to determine whether and to what extent the proposed Phase I project will increase precursors to the development of ozone (volatile organic compounds (VOCs) and nitrogen oxides (NO_x,)) and project consistency with the National Ambient Air Quality Standards (NAAQS), as applicable, in the project area. These data indicated that background pollutant levels (SO2, PM10, PM2.5, NO2, CO, Ozone and Lead) representative of the project area are present in concentrations below the NAAQS.

The mesoscale analysis evaluated VOC and NO_x emissions within the project study area under the following scenarios: a 2018 Existing Condition; a 2025 No-Build (Base) Condition, and a 2025 Build Condition. As shown in the Expanded ENF, the 2025 Build Condition exhibits an increase of NOx and VOC emissions compared to the 2025 Base Condition due to the direct increase in vehicular traffic and increase delay times at project area intersections. NOx emissions are projected to increase from 3.6 tons per year (tpy) to 3.8 tpy and VOCs emissions would increase from 6.6 tpy to 6.8 tpy, respectively, between the 2025 Base Condition and the 2025 Build Condition. MassDEP notes that the projected 2025 Build Condition VOC and NOx emissions are less than those in the 2018 Base Condition, as improvements in vehicle engine and emissions technologies are anticipated.

Due to the anticipated increase in project-related traffic trips, the EIR must include a mesoscale analysis prepared in accordance with MassDEP's Guidelines for Performing Mesoscale Analysis of Indirect Sources for the full build-out of the project. The purpose of the mesoscale analysis is to determine whether and to what extent the proposed project will increase precursors to the development of ozone (volatile organic compounds (VOCs) and nitrogen oxides (NOx,)) in the project area to determine consistency with the Massachusetts State Implementation Plan (SIP). The mesoscale analysis also should be used to meet the MEPA GHG Policy requirement to quantify project-related CO_2 emissions. The Proponent should use data consistent with the project's traffic analysis to evaluate potential traffic-related air emissions in an Existing Conditions, Future No-Build, and Future Build Scenario. MassDEP notes that the traffic and mesoscale analyses presented in the Expanded ENF assumed no traffic background growth between the 2018 Base Condition and 2025 Build Condition, an unusual assumption based upon typical data for the Somerville and metro Boston area. Data assumptions used in the traffic analysis, particularly those associated with assumed background growth within the project area, should be presented with supporting documentation in the EIR and reflected in the mesoscale analysis. Furthermore, while Future No-Build and Future Build Condition air pollutant emissions will likely see improvements due to changes in vehicle emissions reduction technology, the Proponent should identify and implement, as feasible, mitigation measures to reduce overall project-related vehicle trips and associated pollutants. These mitigation measures should seek to offset project-related trip emissions through the elimination of trips, modal shift incentives, and use of technology (e.g., electric vehicle infrastructure) in an effort to further the Commonwealth's goal to reduce GHG emissions from transportation sources. DEP2.1 DEP2.2 DEP2.3

The EIR should include an updated mobile source GHG analysis using data consistent with the current Traffic Impact Assessment Guidelines issued by MassDOT. Mobile source GHG emissions should be estimated for the Existing Condition, Future No-Build Condition, Future Full Build Condition and the Future Full Build with Mitigation Condition. The analysis should provide supporting data/documentation to demonstrate GHG reductions attributable to the proposed Transportation Demand Management program, intersection improvements or other GHG mitigation measures. To ensure that mobile source emissions mitigation measures related to mode share shift are achieved, the EIR DEP2.4

should include a commitment to monitor and evaluate actual mode share data upon project completion and operation and DEP2.5 identify potential enhancement of TDM measures to achieve mode share estimates if they are not achieved.

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Assistont Commissioner
Bureau of Air and Waste
MassDEP
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DEP2.1 Mesoscale analysis.

Chapter 5 of the DEIR included a mesoscale analysis prepared in accordance with MassDEP's Guidelines for Performing Mesoscale Analysis of Indirect Sources for the full build-out of the Project. Since the Project will be improving underused parcels with denser development more suitable for an urban location, new vehicle trips will be created, and therefore the amount of oxides of nitrogen (NOx) and VOCs from vehicles will increase over the No-Build Condition. However, compared to the Existing Condition, it is predicted that NOx and VOCs from Project-related vehicle trips will result in a small increase of 0.4 tons per year of VOCs and a decrease of 2.8 tons per year of NOx.

DEP2.2 Background growth information.

A 0.25-percent annual growth rate, as requested in the MEPA Certificate, was applied to the existing vehicular traffic and transit volumes over the seven-year analysis period from 2018 to 2025 presented in Chapter 4 of the DEIR. The 2025 No-Build Condition also includes the scheduled improvements to Somerville Avenue that include the implementation of streetscaping changes and bi-directional cycle tracks between Union Square and McGrath Highway / Medford Street.

The Transportation Impact Assessment (TIA) has incorporated this growth factor over the entire study area as a conservative measure. Recent vehicle volumes collected by the City at multiple intersections demonstrated a lack of growth, and/or a decline in vehicle counts. The MBTA has also been experiencing a collective decline in bus ridership across its system. To be conservative, the TIA nevertheless applied this growth factor based on the Certificate and discussions with the City and through coordination with the Central Transportation Planning Staff. The results of this TIA were used for the mesoscale analysis provided in Chapter 5 of the DEIR.

DEP2.3 Project-related vehicle trips.

The Project includes a robust TDM program and monitoring program with the intent to minimize vehicle trips and allow the Project to meet its progressive mode share goals. Sections 4.5.7 and 4.5.8 of the DEIR included details about the TDM program and monitoring program.

DEP2.4 GHG analysis.

GHG emissions attributable to traffic for all modeled conditions were presented in Section 7.3 of the DEIR. It should be noted that the Build Condition includes TDM measures, as described in Chapter 4 of the DEIR, to reduce vehicle trips to and from the Project area. These include programs emphasizing public transit, walking, and bicycle

modes, and by improving walking and bicycling infrastructure in the area. Since US2 has committed already to these measures, the Build Condition reflects the improvements from these measures.

DEP2.5 **Commitment to TDM measures.**

Annual Reporting will be conducted to track, assess, and report on the implementation of the MMP as required by the Somerville Zoning Ordinance and the Planning Board's Mobility Management Plan Submittal Standards. Travel surveys are a key component of understanding the level of compliance with policy goals, the manner in which residents and employees are traveling, and whether they are aware of the travel options that are available to them. Depending on progress toward meeting the stated mode split goal and as evidenced by annual reporting, additional programs and services may be considered.

Sections 4.5.7 and 4.5.8 of the DEIR described the commitment to mode share goals in more detail, including the specific TDM measures to be incorporated as part of the Project, and the ongoing monitoring survey and monitoring programs that will be used to evaluate them. Sections 2.4 and 2.5 of the FEIR provide additional details regarding the Project's approach to TDM and transportation mitigation.

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

RECEIVED
AUG 24 2018
MEPA

August 22, 2018

Secretary Matthew A. Beaton
Executive Office of Energy and Environmental Affairs
100 Cambridge Street
Boston, MA 02114

ATTN: Alex Strysky, MEPA Office

RE: Union Square Redevelopment, Somerville, MA; MHC# RC.53031; EEA# 15889

Dear Secretary Beaton:

Staff of the Massachusetts Historical Commission (MHC) have received the Environmental Notification Form (ENF) submitted for the above referenced project. After review of the information submitted, MHC staff have the following comments.

The project site includes approximately 15.7 acres within the Union Square neighborhood of Somerville. The site is made up of seven development blocks or portions of blocks known as the "D Parcels" which were designated for redevelopment in the Union Square Revitalization Plan.

The MHC previously commented on the Union Square Revitalization Plan on April 9, 2013.

The MHC previously reviewed the proposed project at the D2 parcel, also described in the ENF as Phase 1. On August 6, 2014, the MHC determined that the project on the D2 parcel is unlikely to affect significant historic or archaeological resources.

The following properties are listed in MHC's *Inventory of Historic and Archaeological Assets of the Commonwealth* but have been demolished:

Allen-Bonner House, 4 Milk Place (SMV.402)
Schetzer Offices, 36-38 Prospect Street (SMV.1348)
Bennett Auto Exchange Garage, 32-34 Prospect Street (SMV.1347)
Bennett Auto Exchange Body Shop, 26 Bennett Street (SMV.1344)
Prospect Iron and Steel Corporation, 38 Bennett Street (SMV.1346)
Prospect Waste Paper Corporation, 50-52R Prospect Street (SMV.1349)
Prospect Steel Corporation Warehouse, 32 Bennett Street (SMV.1345)

The following properties are listed in MHC's *Inventory of Historic and Archaeological Assets of the Commonwealth* and it is the opinion of MHC staff that the properties listed do not appear to meet the criteria of eligibility for listing in the National Register of Historic Places:

Union Square Garage, 267-271 Somerville Avenue (SMV.772)
Thomas O'Keefe House, 261 Somerville Avenue (SMV.1339)
Boston Elevated Railway – MBTA Bus Garage, 208-220 Washington Street (SMV.676)
Clark Bennett House, 26-28 Prospect Street (SMV.1221)

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Frost-Heggarty House, 30 Prospect Street (SMV.1222)
Michael Canny Used Car, 45 Webster Avenue (SMV.789)
231 Washington Street
9 Union Square (SMV.1435)
2 Union Square (SMV.1434)
298 Somerville Avenue (SMV.1417)
290 Somerville Avenue (SMV.1416)

The U.S. Post Office, located at 237 Washington Street, is individually listed in the State and National Registers of Historic Places.

The MHC looks forward to reviewing the Draft Environmental Impact Report (DEIR). The MHC recommends that the scope of the DEIR for the project include information on project impacts to surrounding historic resources. The MHC also recommends that the DEIR also include a detailed description of the proposed work to the National Register listed U.S. Post Office. MHC.1

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966 (36 CFR 800), M.G.L. Chapter 9, sections 26-27C (950 CMR 71.00), and MEPA (301 CMR 11). Please do not hesitate to contact Elizabeth Sherva of my staff if you have any questions.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
Massachusetts Historical Commission

Enclosures (MHC 4/9/13, MHC 8/6/14)

xc (w/out enclosure): Somerville Redevelopment Authority
Union Square RELP Master Developer LLC
MassDOT
MassDEP
Katherine Ronan, MWRA
Geoff Starsiak, Epsilon Associates
Somerville Historical Commission

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

August 6, 2014

Edward O'Donnell
Director of Economic Development
City of Somerville
93 Highland Avenue
Somerville, MA 02143

RE: Union Square Urban Revitalization Plan, Prospect/Webster Corridor, Green Line Extension Project, Somerville, MA;
MHC# RC.53031 and RC.40762, EEA# 15032

Dear Mr. O'Donnell:

Thank you for submitting a Project Notification Form (PNF) for the project referenced above. The staff of the Massachusetts Historical Commission (MHC) have reviewed the information submitted and have the following comments.

The proposed project consists of the demolition of a number of structures located on the D2 Block, a 3.9 acre area of land in the eastern portion of Somerville adjacent to Union Square. The Site is bordered by Prospect Street to the west, the Fitchburg right of way to the south, Somerville Avenue to the north and the Allen and Linden Street neighborhood to the east. The D2 Block will be the site of the Green Line Extension project's Union Square Station. By way of a Memorandum of Agreement with the Massachusetts Bay Transportation Authority, the City of Somerville is responsible for the demolition of existing buildings and site clearance.

The properties at 4 Milk Place (SMV.402), 26-28 Prospect Street (SMV.1221), and 30 Prospect Street (SMV.1222) are included in MHC's *Inventory of Historic and Archaeological Assets of the Commonwealth.* However, review of MHC files indicates that none of these properties are listed in the State Register of Historic Places, nor does it appear that any of these properties meet the criteria of eligibility for listing in the State Register of Historic Places.

After review of MHC files and the materials you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.

These comments are offered to assist in compliance with M.G.L. Chapter 9, sections 26-27C, (950 CMR 71.00 and MEPA (301 CMR 11)). Please do not hesitate to contact Elizabeth Sherva of my staff if you have any questions.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
Massachusetts Historical Commission

xc: Somerville Historical Commission
Andrew Brennan, MBTA
John Fitzgerald, DHCD

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The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

April 9, 2013

Secretary Richard K. Sullivan, Jr.
Executive Office of Energy and Environmental Affairs (EEA)
100 Cambridge Street, Suite 900
Boston MA 02114

ATTN: Anne Canaday, MEPA Unit

RE: Union Square Urban Revitalization Pla, Prospect/Webster Corridor, Somerville, MA; MHC# RC.53031, EEA# 15032

Dear Secretary Sullivan:

The Massachusetts Historical Commission (MHC) is in receipt of an Environmental Notification Form (ENF) for the project referenced above. The staff of the Massachusetts Historical Commission (MHC) has reviewed the information submitted and has the following comments.

The information submitted as part of the ENF includes the Somerville Urban Revitalization Plan, an Urban Renewal Plan proposed by the Somerville Redevelopment Authority (SRA). Projects undertaken by the SRA, acting under Housing & Urban Renewal Legislation (M.G.L Ch 121B), are subject to review under M.G.L. Chapter 9, Section 26-27c, as amended (950 CMR 71.00). The MHC will review all proposed demolitions, rehabilitations, and new construction to determine their potential effects on properties that are listed in the State and National Registers of Historic Places and/or included in MHC's Inventory of Historic and Archaeological Assets of the Commonwealth.

The Union Square Urban Revitalization Plan targets three distinct geographic areas within the Revitalization Area: the Prospect/Webster Corridor, Boynton Yards, and the McGrath/Medford Corridor. The subject of the ENF encompasses only the Prospect/Webster Corridor. The ENF also states that the Boynton Yards and McGrath/Medford Corridor areas will be the subject of a major urban renewal plan change to be filed with MEPA at a later time. The MHC will comment on those areas separately, at such time when an ENF is filed with MEPA or, alternately, if a Project Notification Form (PNF) is filed with the MHC.

The Prospect/Webster Corridor section, as currently proposed in the ENF, involves the demolition of three structures, none of which are included in MHC's *Inventory of Historic and Archaeological Assets of the Commonwealth*. Additional properties that are included in the Inventory are contained within the Prospect Webster Corridor Area, including the MBTA Bus Garage (SMV.676), the auto body shop at 45 Western Avenue (SMV.789), and the properties at 26-28 Prospect Street (SMV.1221) and 30 Prospect Street (SMV.1222).

Conflicting information exists between the information contained in the ENF and the original information included in the Union Square Urban Revitalization Plan. The Union Square Urban Revitalization plan includes a map (Map 12.02(1)(i)) which indicates much more demolition than the map included in the ENF, including demolition of three Inventoried properties: the auto body shop at 45 Western Avenue

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MHC.1 **Project related impacts on surrounding historic resources.**

US2 has conducted a detailed analysis of Project-related impacts on surrounding historic resources. Chapter 11 of the DEIR included information on impacts to surrounding historic resources, including a discussion of visual impacts and detailed information about shadow impacts. The Massachusetts Historical Commission has determined that the Project will have 'no adverse effect'.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

August 24, 2018

Matthew A. Beaton, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge St, Suite 900
Attn: MEPA Office, Alex Strysky
Boston, MA 02114

Subject: EOEEA #15889 – Expanded Environmental Notification Form
Union Square Redevelopment, Somerville, MA

Dear Secretary Beaton,

The Massachusetts Water Resources Authority (MWRA) appreciates the opportunity to comment on the Expanded Environmental Notification Form (EENF) submitted by Union Square RELP Master Developer LLC and Somerville Redevelopment Authority (together, the "Proponent") for Union Square Redevelopment (the "Project") in Somerville, Massachusetts. In addition to reviewing the EENF, MWRA met with Mr. Frank Holmes the Proponent's engineering consultant, on August 6, 2018, and received additional information from Mr. Holmes regarding the Project programming, scheduling, wastewater impact mitigation and potential MWRA permitting by memorandum dated August 16, 2018 (copy attached).

The Union Square Redevelopment includes the redevelopment of approximately 15.7 acres in the Union Square neighborhood of Somerville (the "Project"). According to the Proponent, the Project is substantially consistent with the program described in the approved Union Square Neighborhood Plan dated May 5, 2016. The Project site consists of seven development blocks or portions of blocks known as the "D Parcels" or "D Blocks," which were approved for redevelopment under the Union Square Revitalization Plan, an urban renewal plan pursuant to M.G.L. Chapter 121B (EEA# 15032). The Project's purpose in revitalizing Union Square is spurred by the proposed introduction of new transit to the neighborhood via the $2.3 billion Green Line Extension transit project (the "GLX"). The current EENF includes basic information on the potential environmental impacts of the full-build Project, which the Proponent proposes to implement in three phases, and extensive information on the first phase ("Phase 1") in support of a Phase 1 Waiver request accompanying the EENF.

The Project is proposed to include approximately 17 new buildings and the renovation of one building (a former post office), totaling approximately 2.4 million square feet (sf) of mixed use development. The Project also includes new civic spaces totaling more than 108,000 sf and

approximately 43,500 sf of new thoroughfares to create new connections through the Union Square area.

Phase 1 is located primarily on the "D2 Block," or "North Prospect Block," in the heart of Union Square and is bordered by Somerville Avenue to the north, Prospect Street to the west, the MBTA Fitchburg Line right-of-way to the south and privately owned parcels fronting Allen Street to the east. Phase 1 also includes renovation of the former United States Post Office Building fronting on Washington Street east of Bonner Avenues (Block D5.1) to accommodate approximately 17,000 sf of retail space and approximately 20,000 sf of arts and creative enterprise ("ACE") space. On the D2 Block, Phase 1 will transform 3.5 acres of environmentally contaminated land (including a former Superfund site) that is currently vacant and is entirely owned by the City of Somerville and the Somerville Redevelopment Authority. Phase 1 is approximately 607,000 sf (exclusive of parking) and includes approximately 166,000 sf of office/laboratory space, approximately 29,000 sf of ground floor retail space, approximately 13,000 sf of ACE space, and approximately 450 apartments, approximately 290 commercial parking spaces and approximately 15,100 sf of civic/public open space. The D2 Block is immediately adjacent to the future Union Square Station, and Phase 1 therefore also includes components that will provide for full functionality of the station. Both Phase 1 development and the Union Square Station are scheduled to be completed for occupancy and service in 2021. To ensure that Phase 1 is complete when the Union Square Station begins service, the Proponent is seeking a Phase 1 Waiver to allow for the commencement of Phase 1 construction prior to completion of full MEPA review for the full-build project.

Among other local economic and public monetary benefits noted in the EENF, Phase 1 reportedly will help fund the City of Somerville's $63 million Somerville Avenue Utility and Streetscape Improvements ("SAUSI") project. The SAUSI project includes a 14-foot by 6-foot stormwater culvert now under construction by the City along Somerville Avenue to Union Square. It is one of three major city-proposed infrastructure improvements, including the City's proposed Poplar Street Stormwater Pump Station and sewer separation in the Spring Hill area, that are intended to reduce the risk and impacts of flooding in Union Square, improve the City's storm drain and sewer systems in the area, separate combined sewer systems that serve parts of the city that drain to Union Square (and to MWRA's wastewater system at Union Square), and provide some sewer system impact mitigation for the Union Square Redevelopment's wastewater flows.

According to the Proponent, the SAUSI project's stormwater culvert will provide 800,000 gallons of stormwater storage in the short-term. The box conduit will eventually transport stormwater flows from a proposed sewer separation project in the Spring Hill area to the proposed Poplar Street Pump Station that will pump the stormwater into the MBTA's existing GLX storm drain system, by agreement with MBTA. According to the Proponent, the agreement allows the City to pump stormwater into the MBTA's drainage system within the Green Line right of way south of Washington Street at a rate of 50 million gallons per day so long as flood elevations remain 6 inches below the top of rail on the Fitchburg line. Above that flood level, the City must curtail and eventually cease pumping until the track flooding recedes. With completion of all three city stormwater related improvements (the box conduit, the Poplar Street Pump Station and the Spring Hill area sewer separation), the City expects to divert stormwater generated on approximately 200

acres from its combined sewer system (and downstream MWRA system) to the MBTA's stormwater system, which discharges to the Millers River and Charles River Basin.

Phases 2 and 3 are proposed to include the construction of 14 new buildings in and near Union Square. These phases will add approximately 992,000 sf of office/lab space, approximately 94,000 sf of ground floor retail space, a 175-room hotel, approximately 41,000 sf of ACE space, up to 548 residential units, approximately 1,200 ancillary and commercial parking spaces, and approximately 93,500 sf of civic/public open space.

MWRA's comments relate to wastewater issues and emphasize the need for Infiltration/Inflow (I/I) Removal, Discharge Permitting from the Toxic Reduction and Control (TRAC) Department and MWRA Enabling Statute Section 8(m) Permitting.

Stormwater and Wastewater

The entire Project site, including all redevelopment blocks, is in an area of Somerville served by combined sewers or by separate storm drains and sanitary sewers that eventually connect to the City's combined sewer system. Stormwater runoff from the Project site is conveyed, along with sanitary flows, through the City's combined sewer system to MWRA's Cambridge Branch Sewer. The Cambridge Branch Sewer collects combined stormwater and sanitary flows from large areas of East Cambridge and most of the land area of Somerville, and conveys the flows to MWRA's DeLauri Pumping Station, which pumps these flows, along with combined stormwater and sanitary flows from other parts of Somerville and from Charlestown and separate sanitary flows from parts of Medford to MWRA's Metropolitan Sewer system for transport to the Deer Island Wastewater Treatment Plant. In large storms, the volume of stormwater entering combined sewers from Cambridge, Somerville and Charlestown can exceed the capacities of the Cambridge Branch Sewer and DeLauri Pumping Station and contribute to combined sewer overflow ("CSO") discharges to the Mystic and Charles rivers.

The EENF reports that the Project at full-build will generate wastewater flow of approximately 142,417 gallons per day (gpd), which the Proponent reports is an increase of 126,658 gpd over the estimated existing wastewater generation of 16,759 gpd from current uses on the Project site. The EENF reports that Phase 1 will increase wastewater flow by 35,204 gpd. While existing City of Somerville and MWRA sewers may have adequate capacity to accommodate the Project's wastewater flows in dry weather and small storms, the additional wastewater flows have the potential to contribute to larger CSO discharges to the Mystic and Charles rivers in large storms.

To ensure that the Project's new wastewater flow does not increase sewer surcharging and overflows in large storms and does not compromise the environmental benefits of MWRA's recently completed $910 million CSO control program, including water quality benefits for the Mystic and Charles rivers, the Proponent should fully mitigate the Project's potential wastewater flow impacts MWRA.1
with infiltration/inflow ("I/I") or stormwater removal in compliance with Massachusetts Department of Environmental Protection ("MassDEP") regulation and in accordance with City of Somerville I/I policy. The Proponent reports (8/16/18 memo, copy attached) that, in accordance with Mass DEP regulation, the City of Somerville has formally adopted an I/I ordinance that requires 4:1 offset of any increase in wastewater flow (removal of 4 gallons of I/I or stormwater from the sewer system for

every gallon of new wastewater). The Proponent also reports that it will comply with the City's I/I mitigation requirements by either contributing to the City's I/I mitigation fund, to help offset the City's costs for combined sewer separation and infiltration reduction projects, or will privately execute I/I mitigation projects identified by the City. The Proponent further states that, in either case, it will work closely with the City to ensure that the I/I mitigation is completed as required. The EENF includes the following related information:

- The City's Somerville Avenue Utility and Streetcape Improvements project represents a significant improvement in the ability of the City's infrastructure to store stormwater and reduce the magnitude and extent of surcharging events in Union Square. As detailed design plans for each of those Blocks are developed, the design of the site and landscape and the stormwater management systems will include appropriate measures to infiltrate stormwater where feasible, and to detain stormwater to reduce the peak rates of runoff from existing conditions. The reduction in peak rates of runoff from each portion of the Project will provide benefits to the municipal stormwater (and sewer) infrastructure.

- Stormwater detention and infiltration, where feasible and practicable, will be incorporated into the design of each D Block to reduce the rate and volume of stormwater discharged from the development for all storms up to and including the 100-year storm event. Reducing the rate and volume of stormwater discharge will reduce the pressure on the existing infrastructure and will help reduce the extent and duration of surcharging in the City's infrastructure during intense storm events.

- Infiltration and Inflow mitigation at the rate of 4:1 will be provided for increased sewage flows to the City's sewage collection system. As the design of individual D Blocks advances, the Proponent will coordinate specific improvements to offset increased sewage flows with the City. Specific mitigation could include increased active storage on development parcels that will reduce peak rates and volumes of stormwater runoff to the City's combined sewer systems during storm events.

Sewer system surcharging and CSO overflows are sensitive to increases in wastewater flow in the Project area, and I/I or stormwater removal must be from hydraulically related sewer systems in order to achieve effective offset. It is unclear the extent to which the Project's stormwater detention and infiltration systems, the City's stormwater infrastructure improvements noted above MWRA.2
and/or other mitigation projects by the City or the Proponent will contribute to meeting the required wastewater flow offset. MWRA requests that it be informed of plans to meet the City's 4:1 I/I mitigation requirement for Phase 1 in advance of Phase 1 occupancy. The Proponent should also MWRA.3
describe in more detail in the Draft Environmental Impact Report how the City and Proponent will satisfy the I/I mitigation requirements for each and all phases of the project.

TRAC Discharge Permitting

Pursuant to 360 C.M.R. 10.091-10.094, a Construction Dewatering Permit is required prior to the discharge of groundwater from any construction sites associated with the Project into the sanitary sewer system. For assistance in in obtaining this permit, both the Proponent and the MWRA.4
Contractor should contact Stephen Buczko, Industrial Coordinator in the MWRA TRAC Department at 1 (617) 305-5619.

An MWRA Sewer Use Discharge Permit is required prior to discharging wastewater from any laundry operations into the MWRA sanitary sewer system. For assistance in obtaining this permit, the Proponent should contact Stephen Buczko, Industrial Coordinator, in the MWRA TRAC Department at 1 (617) 305-5619. MWRA.5

Any gas/oil separators installed in parking garages associated with the Project must comply with 360 C.M.R. 10.016, and the regulations of the Board of State Examiners of Plumbers and Gas Fitters, 248 C.M.R. 2.00 (State Plumbing Code). The installation of gas/oil separators may not be back filled until inspected and approved by MWRA and BWSC Plumbing Inspectors. For assistance in obtaining an inspection the Proponent should contact Alix Pierre Louis, Regional Manager in the MWRA TRAC Department at 1 (617) 305-5660. MWRA.6

Section 8(m) Permitting

Section 8(m) of Chapter 372 of the Acts of 1984, MWRA's Enabling Legislation, allows the MWRA to issue permits to build, construct, excavate, or cross within or near an easement or other property interest held by the MWRA, with the goal of protecting Authority-owned infrastructure. The Proponent should coordinate with Kevin McKenna in the MWRA Water and Wastewater Permitting Group at 1 (617) 305-5956 to identify any utility connections resulting from the Project that may cross MWRA infrastructure. MWRA.7

On behalf of the MWRA, thank you for the opportunity to provide comments on this Project. Please do not hesitate to contact me at 1 (617) 788-4958 with any questions or concerns.

Sincerely,

Bethany Card
Director
Environmental and Regulatory Affairs

cc: Holly Johnson, DEP
John Viola, DEP
David Kubiak, MWRA
Kattia Thomas, MWRA
Kevin McKenna, MWRA
Rob King, City of Somerville

Stantec

Memo

To:	Kathleen Ronan MWRA	From:	Frank Holmes Stantec
File:	179801783	Date:	August 16, 2018

Reference: Union Square Revitalization EENF (MEPA EEA No. 15889)

Thank you for organizing the meeting held on August 6th at the MWRA's Chelsea facility to discuss the EENF for the Union Square Revitalization project. Below is additional information to respond to the questions that we discussed at that meeting:

1. Project Program. The program described in the EENF is substantially consistent with the program described in the approved Union Square Neighborhood Plan dated May 5, 2016. The Union Square Neighborhood Plan contemplated approximately 2.3 million square feet (60% commercial and 40% residential) within the Union Square Revitalization Project and the EENF program contemplates 2.4 million square feet (61% commercial and 39% residential).

2. Project Schedule. The project phasing plan that was included in our master plan application is attached as Exhibit A. Phase 1 is projected to be completed in 2021. Phase 2 delivery is currently projected for completion in 2022-2023 (subject to market conditions). Phase 3 will follow Phase 2 and the individual buildings in Phase 3 will implemented individually as market conditions permit. The overall project is projected for completion by 2036.

3. Stormwater Management and I/I Mitigation. The City of Somerville currently is addressing Infiltration and Inflow, and reductions in combined sewer overflows, with a three-part coordinated program consisting of: the City's' Somerville Avenue Utility and Streetscape Project, the City's proposed stormwater connection to the MBTA's drainage system, and a sewer separation project in the Spring Hill area. Phase 1 of the proponent's overall Union Square Redevelopment project, consisting of the D2 parcel, is critical to the funding of these initiatives. Phase 1 private investment facilitated the $16 million MassWorks infrastructure grant that enabled the project. Phase 1 also includes a $1 million infrastructure contribution, and Phase 1 real estate taxes will fund debt service for the City's infrastructure bonds for the Somerville Avenue Utility and Streetscape project.

   The City's $63 million Somerville Avenue Utility and Streetscape project is currently under construction and includes a box culvert that will provide 800,000 gallons of stormwater storage to mitigate neighborhood flooding. This project represents a significant investment the long-term goal of separating combined sewer throughout the City as it will ultimately provide stormwater conveyance to the MBTA drainage system. In the short term, the storage provided by the box culvert will also help reduce combined sewer overflows at Prison Point as it provides new in-system storage.

   The City has also entered into an agreement with the MBTA that will allow a connection from the City's stormwater system to the MBTA's drainage system within the Green Line right of way south of Washington Street. The agreement permits the City to pump stormwater into the MBTA system at a rate of 50 million gallons per day so long as flood elevations remain 6-inches below the top of rail on the Fitchburg line. Under those flood conditions, the City must curtail and eventually cease pumping until the track flooding recedes. To leverage the agreement, in addition to completing the Somerville Avenue Drain, the City intends to proceed with the downstream Poplar Street Stormwater Pump Station that will provide the connection to the MBTA system, and the upstream Spring Hill Sewer Separation that will supply the separated stormwater. Once all three components are complete, the connection will divert stormwater from approximately 200 acres from the City's combined sewer system to the MBTA's stormwater system, which discharges to the Millers River and then to the Charles

River, thereby conditionally removing significant stormwater volumes that currently drain to the Deer Island Treatment Plant. .

In addition to the sewer separation described above, the City is also completing a manhole sealing program throughout the City that will reduce infiltration by an estimated 120,000 gallons per day. The City is currently conducting pipeline investigations to identify additional infiltration reduction opportunities.

It should also be noted that the City has formally adopted an I/I ordinance that requires 4:1 offsets for any increase in wastewater flow. The proponent will comply with the City of Somerville's I/I mitigation requirements. For the Phase 1 project, the proponent will either contribute to the City for I/I mitigation (approximately $1 million), which will help to offset the City's costs for their combined sewer separation and infiltration reduction projects, or will privately execute I/I mitigation projects identified by the City that will remove I/I form the City's combined sewer system in an amount equal to at least four times the daily sewerage generation. In either case, the proponent will work closely with the City to ensure that the I/I mitigation has been completed on or before the delivery of the Phase 1 buildings.

4. Potential MWRA Permit Requirements. In addition, we acknowledge that the following MWRA permits may be required as the Union Square Revitalization project is implemented:

    1. If D2 project construction requires dewatering that will be discharged to the City's combined sewer system and that will eventually flow to the MWRA's facilities, then we will obtain a Dewatering Permit from the MWRA.

    2. If the laboratory use in the D2.1 building warrants a MWRA Industrial Waste, then we will obtain the same from the MWRA.

    3. If the development of the D3 parcel requires building, construction, excavation or crossing a MWRA easement or other property interest adjacent to the D3 site, we will obtain a MWRA 8(m) permit.

After your review, please let me know if you have any further questions or comments, or if you require any additional information.

Stantec Consulting Services Inc.

Frank Holmes

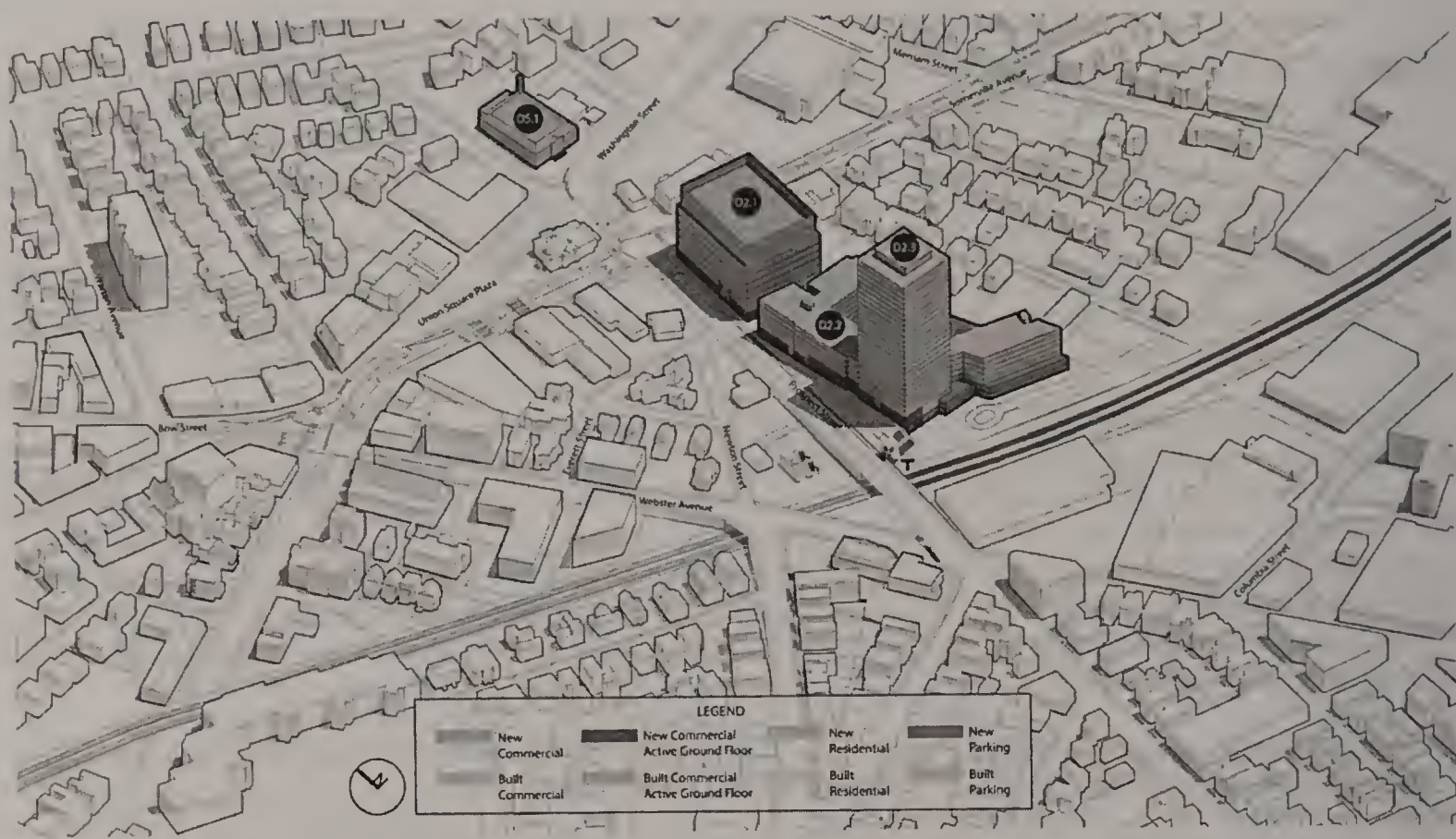
Frank Holmes , PE, LEED AP
Principal

Phone: (617) 654-6059
Fax: (617) 523-4333
frank.holmes@stantec.com

c. Greg Karczewski, Union Square Station Associates LLC
Brad Rawson, City of Somerville
Rich Raiche PE, City of Somerville

EXHIBIT A

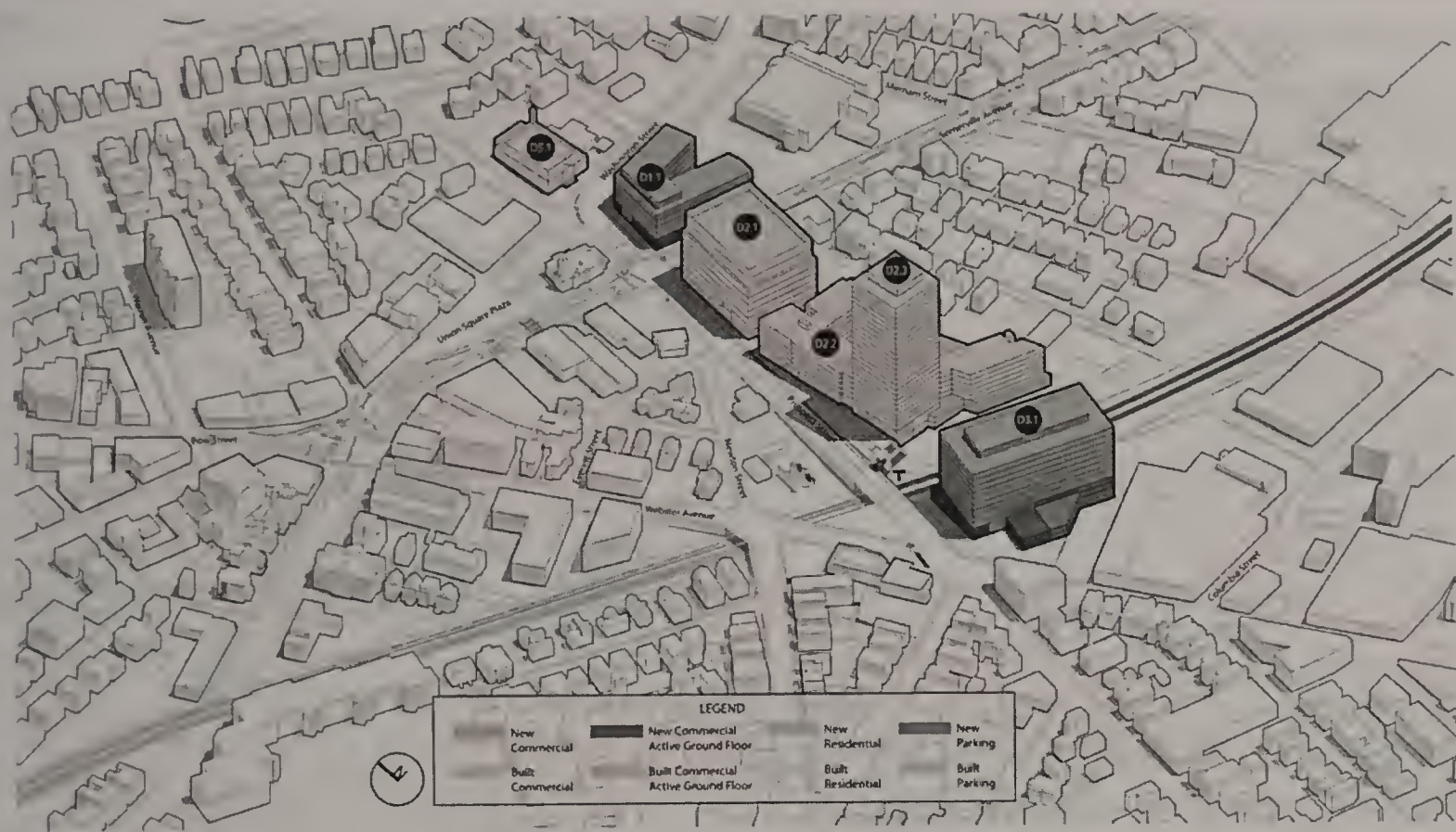
PHASE 1 (D5.1, D2)



PROGRAM	ADDED SF	ADDED %	TOTAL SF	TOTAL %
Commercial SF	245,000	38%	245,000	38%
Residential SF	399,000	62%	399,000	62%
CUMULATIVE TOTAL SF	**644,000**		**644,000**	

Project Phase 1 will mark the beginning of the transformation of Union Square into an urban employment center. This phase understands the current and future heart of the neighborhood, Union Square Plaza, as foundational – and works to bridge access to it from the new community node that will be the Green Line Station. To that end, Phase 1 anticipates the construction of the D5.1 Block, the former Post Office, and the D2 Block simultaneously as the spaces aim to be in operation on or before the arrival of the Green Line extension. The D2 Block is anticipated to start construction in 2018 and be completed in late-2020. The D5.1 Block will be redeveloped into a mixed use commercial building that includes arts and creative uses as well as retail uses. The D2 Block will be comprised of multiple structures. Anchoring the corner of Prospect Street and Somerville Avenue, Union Square's first significant commercial building will rise on D2.1. The balance of the site will support a residential building across parcels D2.2 and D2.3, and provide access to and from the MBTA Green Line platform. As the street wall is built out along the length of the D2 Block, active ground floor uses in combination with generous civic spaces will begin to establish a strong connection between the two landmark community nodes that are Union Square Plaza and its Transit Station.

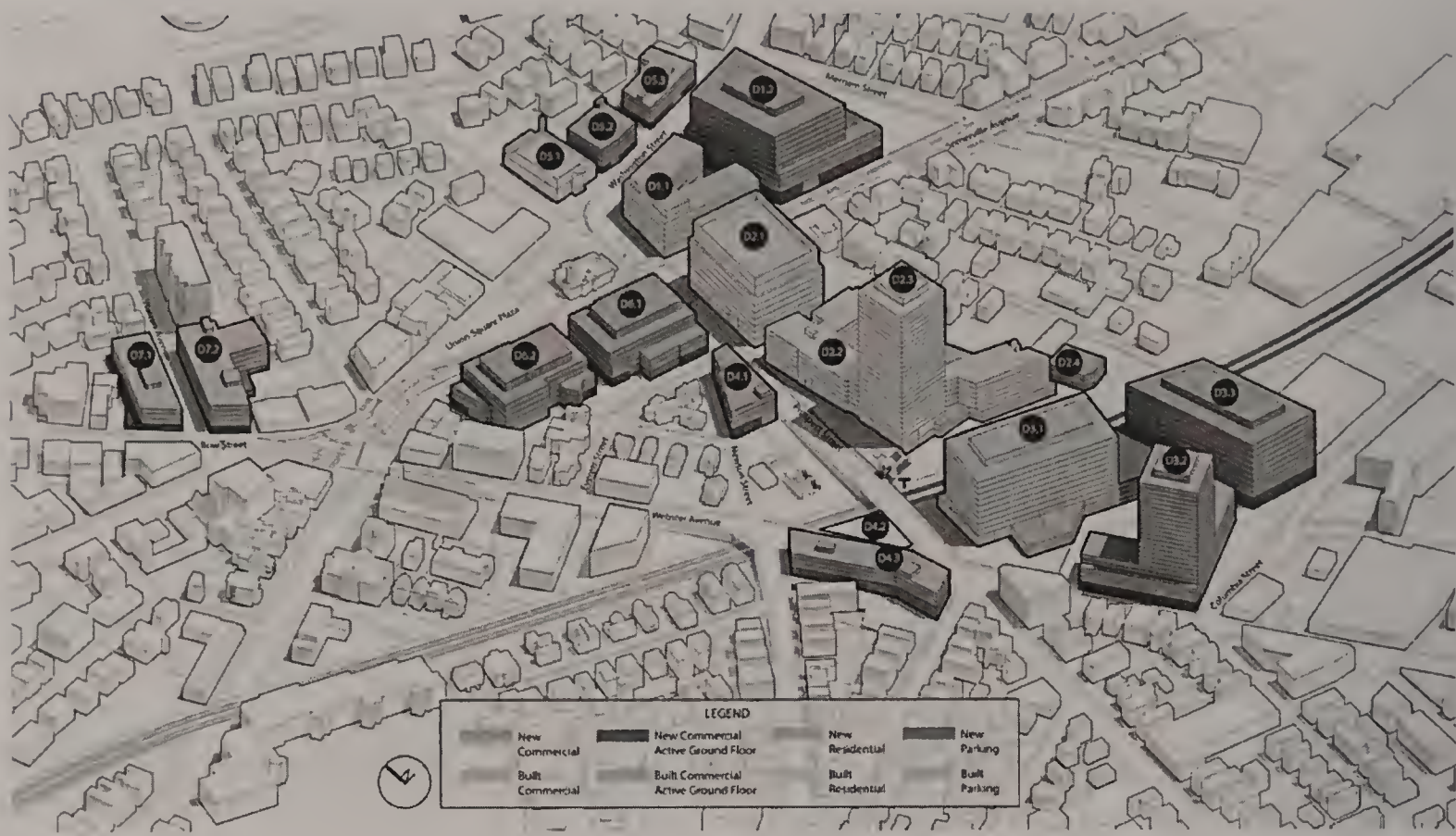
PHASE 2 (ADDS D1.1, D3.1)



PROGRAM	ADDED SF	ADDED %	TOTAL SF	TOTAL %
Commercial SF	385,000	100%	630,000	61%
Residential SF	-	0%	399,000	39%
CUMULATIVE TOTAL SF	**385,000**		**1,029,000**	

Phase 2 is focused on completing the Prospect street wall started in Phase 1 in order to secure a strong connection between the new MBTA Green Line station and Union Square plaza. South of the new Green Line station, D3.1 is envisioned as a 280,000 square foot commercial lab or office building. Across Somerville Avenue, facing Phase 1's commercial project, D1.1 site will be transformed into an approximately 175-room hotel, a use that will serve as a significant amenity to Union Square's increasingly commercial user base and will be a significant commercial tax producer. In total, Phase 2 will add approximately 385,000 SF of commercial space at which point it is anticipated that the project will have realized a cumulative 61% commercial and 39% residential use mix.

PHASE 3 (ADDS D1.2, D3.2-3, D4, D5.2-3, D6, D7)



	ADDED		TOTAL	
PROGRAM	**SF**	**%**	**SF**	**%**
Commercial SF	834,000	61%	1,464,000	61%
Residential SF	534,000	39%	933,000	39%
CUMULATIVE TOTAL SF	**1,368,000**		**2,397,000**	

Phase 3 involves the build-out of the balance of the project. Considering the uncertainty of the future, each of these projects will be implemented individually as market conditions and user demands permit. Definitive plans regarding the sequencing of the individual projects that comprise Phase 3 will be further developed as Phases 1 and 2 are underway.

MWRA.1 **Mitigation for the Project's potential wastewater flow impacts with infiltration/inflow (I/I) or stormwater removal in compliance with Massachusetts Department of Environmental Protection (MassDEP) regulation in accordance with City of Somerville I/I policy.**

The Project will increase wastewater contributing to the City's existing sewer system. I/I mitigation, discussed in Section 10.1.3 of the DEIR, will mitigate this impact. Coordination with the City is ongoing and will continue throughout the development of the Project. US2 has met with the City to discuss the application of the City's 4:1 I/I mitigation policy to the Project, and will work with the City to meet policy requirements as the Project is implemented.

MWRA.2 **Clarify the Project's wastewater flow offset.**

The City's $63 million Somerville Avenue Utility and Streetscape Improvements project is currently under construction and includes a box culvert that will provide 800,000 gallons of stormwater storage to mitigate neighborhood flooding. This project represents a significant investment for the long-term goal of separating combined sewer throughout the City as it will ultimately provide stormwater conveyance to the MBTA drainage system. In the short term, the storage provided by the box culvert will also help reduce combined sewer overflows at Prison Point as it provides new in-system storage.

In addition to the sewer separation described above, the City is also completing a manhole sealing program throughout the City that will reduce infiltration by an estimated 120,000 gpd. The City is currently conducting pipeline investigations to identify additional infiltration reduction opportunities.

Although the Somerville Avenue Utility and Streetscape Improvement project is being supported by the Project, it is not included as part of the I/I mitigation of the Project. Section 10.1.3 of the DEIR included additional information with respect to the City's plan to address I/I measures.

MWRA.3 **Describe in more detail how the Project will satisfy the I/I mitigation requirement for each and all of the Project phases.**

The Project will be implemented in phases and buildings will be constructed on a Lot-by-Lot basis. Please refer to Section 1.2.3.1 of the FEIR for additional information regarding Project phasing and a calculation of the estimated I/I mitigation for each Lot. As part of the permitting process for each Lot, the City will determine the I/I mitigation requirements for that Lot based on the projected flows. US2 is responsible for

completing the I/I requirements before a Certificate of Occupancy can be issued for that Lot.

MWRA.4 Construction Dewatering Permit.

If and when necessary, a Temporary Construction Dewatering Permit will be coordinated and obtained from the MWRA for the discharge of groundwater from any construction site into the sanitary sewer system. Each Lot will be evaluated individually and will be addressed during the permitting for that Lot.

MWRA.5 MWRA Sewer Use Discharge Permit.

If and when necessary, an MWRA Sewer Use Discharge Permit will be coordinated and obtained from the MWRA for the discharge of wastewater from any laundry operations or laboratory wastewater into the MWRA sanitary sewer system. Each Lot will be evaluated individually and will be addressed during the permitting for that Lot.

MWRA.6 Gas/oil separators.

All gas/oil separators installed in parking garages will be designed to comply with 360 C.M.R. 10.016, the regulations of the Board of State Examiners of Plumbers and Gas Fitters, and the regulations of the State Plumbing Code. Prior to any backfill of these structures, appropriate inspections will be coordinated with MWRA and the local plumbing inspector as necessary.

MWRA.7 8(m) Permit.

If and when necessary, an MWRA 8(m) Permit will be coordinated and obtained from the MWRA Water and Wastewater Permitting group for the construction, excavation, or crossing within or near property interest held by the MWRA. Each Lot will be evaluated individually and will be addressed as part of the permitting process for that Lot.

August 24, 2018

Matthew A. Beaton, Secretary
Executive Office of Energy & Environmental Affairs
Attention: MEPA Office – Alex Strysky, MEPA #15889
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: Union Square Redevelopment, MEPA #15889, Environmental Notification Form

Dear Secretary Beaton:

The Metropolitan Area Planning Council (MAPC) regularly reviews proposals deemed to have regional impacts. The Council reviews proposed Projects for consistency with *MetroFuture*, the regional policy plan for the Boston metropolitan area, the Commonwealth's Sustainable Development Principles, consistency with Complete Streets policies and design approaches, consistency with the requirements of the Global Warming Solutions Act (GWSA), as well as impacts on the environment.

The Union Square Redevelopment (the Project) is a mixed-use and equitable transit-oriented development (ETOD) of approximately 2.4 million square feet (sf) in 7 development parcels, referred to as the "D Blocks." Union Square RELP Master Developer LLC (US2) and the Somerville Redevelopment Authority (SRA) (jointly, the Proponent) propose to redevelop approximately 15.7 acres in the Union Square neighborhood of Somerville. It is anticipated that the entire Project will be constructed in three phases.

The development program includes 1.15 million sf of office/lab space, 140,000 sf of retail space, a 93,000-sf hotel, 74,000 sf of arts/creative space, and 933,000 sf of residential units (up to 998), including 183-213 affordable units. These affordable units help to earn the Project the ETOD title, because it will help to advance equity in the region, in addition to creating strong links between transit, jobs, and homes. When complete, the Project will include a maximum of 1,500 parking spaces and is forecast to generate 9,770 average daily trips[1].

The Proponent has requested a Phase 1 Waiver. Phase 1 involves development of the 3.5 acre D2 Block and includes a total of 607,000 sf of development (Phase 1 Project). Specifically this development would comprise 166,000 sf of office/lab space, 29,000 sf of retail space, and 450 residential units (including 90 affordable units). The Phase 1 Project site is bound by Prospect Street to the west, the MBTA Fitchburg Commuter Rail tracks to the south, and Somerville Avenue to the north. The Phase 1 Project will include 290 parking spaces and is forecast to generate 2,100 average daily trips[2].

[1] 9,770 average daily trips are adjusted. Unadjusted daily trips are 23,239.
[2] 2,100 average daily trips are adjusted. Unadjusted daily trips are 4,992.

This Project is the product of an extensive public process spanning nearly a decade and reflects the City's ongoing partnership with the MBTA in support of the Green Line Extension project (GLX).

The Project is currently within walking distance of multiple MBTA bus routes and will be adjacent to the MBTA's GLX project once it is completed. As a high density mixed-use development, this Project has the potential to advance several of the region's transportation goals, as enunciated in MetroFuture. It also has the potential to advance the Commonwealth's statutory obligation to meet the GHG reductions of the GWSA — 25% from 1990 levels by 2020 and by 80% from 1990 levels by 2050.

The following recommendations are intended to help this Project to reach its full potential. The recommendations include ensuring that the robust Transportation Demand Management (TDM) program outlined for the Phase 1 Project is implemented for the rest of the Project, as well as aligning this project with the goals of the soon-to-be-completed Lower Mystic Regional Working Group's (LMRWG) study.

In this case, MAPC supports granting of the Phase 1 Waiver, because it will help to coordinate the early elements of the Project with ongoing GLX and Site Improvement activities, while minimizing adverse impacts and helping to keep the Commonwealth on track in meeting its regulatory and statutory goals. MAPC respectfully requests that you require the Proponent to address our recommendations and questions in the Draft Environmental Impact Report (DEIR) and the forthcoming Section 61 Findings.

Thank you for the opportunity to comment on this Project.

Sincerely,

Marc D. Draisen
Executive Director

cc: Mayor Joseph A. Curtatone, City of Somerville
George Proakis, City of Somerville
Brad Rawson, City of Somerville
David Mohler, MassDOT

Phase 1 Waiver

The Proponent is seeking a Phase 1 waiver in order to allow for the conveyance of the D2 Block to US2 by the SRA and for construction to commence prior to completion of the full MEPA review for the Project as a whole. The Proponent intends to proceed on an accelerated timeline in order to facilitate coordination with the construction schedules of the GLX and the Somerville Avenue Utility and Streetscape Improvements project. The granting of this waiver, and the ability of these activities to proceed in tandem, will ensure that required infrastructure is in place in a timely manner and will limit the amount of time that overall construction will impact the community around Union Square Station.

Therefore, MAPC supports the granting of the Phase 1 Waiver in this case.

Public Transportation

When complete, the Project will be an equitable transit-rich development that will bring significant opportunities to increase use of public transportation and reduce demand for single occupant vehicle (SOV) travel. This mixed-use site will serve as both a neighborhood with expanded residential opportunities, an urban employment center, and a new community node for transit, walking, and biking.

The Phase 1 Project site is located within a quarter mile of five MBTA bus routes that directly serve Union Square: Routes 85, 86, 87, 91, and CT2. Five additional MBTA bus routes (69, 80, 83, 88, and 90) provide service within a half-mile of the Phase 1 Project site. The GLX will serve as the catalyst for the Project and will be constructed adjacent to the Phase 1 Project. The Project is designed and intended to build upon the expanded access that will be created by the GLX.

The Project has been a major partner and contributor to the GLX project, including the coordination of design elements to benefit MBTA operations and access. US2 has agreed to fund approximately $5.8 million toward the City's GLX payment, with approximately $1.5 million coming from the Phase 1 Project. These payments will help offset the City's commitment to contribute $50 million to the GLX project.

While MAPC applauds the Proponent for addressing improvements to public transportation as part of the GLX project, the DEIR should address how the Proponent will coordinate with the MBTA, specifically identifying how connections to and from the Project can be enhanced for the MBTA buses servicing this area. The Proponent should partner with the MBTA by contributing to service improvements for bus lines servicing the site, in an amount that is reasonably related to the Project's additional demand. MAPC.1 MAPC.2

As part of a mitigation program, the Proponent needs to work with the MBTA to address how these MBTA bus routes could be improved to maximize ridership. This includes, but is not limited to, review of pick-up/drop-off locations, scheduling, and route adjustments. It is important to point out that a key recommendation of the LMRWG Study will be make improvements to public transit. MAPC.3

There are two such precedents for developers committing to public transit improvements through the MEPA process. One is Encore Boston Harbor's commitment to improving Orange Line

service. The second precedent relates to development in Kendall Square in Cambridge, where Boston Properties, the City of Cambridge, the Cambridge Redevelopment Authority, the MBTA, and MassDOT signed a Memorandum of Understanding, under which Boston Properties will contribute a transit improvement fee of $6 million to support MBTA service improvements.

Parking

A key finding of the LMRWG report is local parking policies have a powerful impact on traffic demand. Therefore, one of the study's key recommendations is to reduce the amount of parking in new residential development within walking distance to transit.

MAPC commends the both the City of Somerville and the Proponent for recognizing that parking management is a key element to managing vehicular demand. As part of the Phase 1 Project, the City has already established mandatory requirements for best practices in parking management: "unbundled" parking and appropriate parking pricing. These requirements are included in the City's Coordinated Development Special Permit and Mobility Management Plan. The Proponent intends to pursue the following measures to manage parking:

Unbundled Parking

All residents and employers must purchase and/or lease parking separately from any office and/or residential space. This strategy ensures that users understand the true cost of parking and can make transportation choices accordingly. Since on-site parking will be an optional amenity rather than a required purchase, this policy allows the developer to focus resources on the creation of commercial and residential space, including affordable rentals, rather than parking that could be under-utilized in the future.

Market Rate Pricing

Parking for both residential and commercial uses will be available at local market rates. Parking pricing is an effective tool that both balances demand and encourages people to travel using more cost-effective modes such as transit, walking, and/or bicycling.

Daily Pricing

When practical and feasible, employers will be encouraged to provide parking at daily rates rather than monthly leases. When users pay for parking each day, they are reminded of its cost, which encourages them to choose other modes. Moreover, avoiding monthly leases helps to eliminate the mentality that parking is a "sunk cost" and instead encourages flexibility in travel options.

Allocation of Parking Spaces

Union Square is a premiere ETOD site located in close proximity to public transportation, enabling many people to live and work car-free. While MAPC applauds the Proponent for establishing a 1,500 parking space maximum for the Project, we respectfully request that the MAPC.4
DEIR present a detailed parking needs assessment. The Proponent needs to disclose the allocation of proposed parking spaces to land use for each Project phase, preferably in a matrix format along with an explanation of the methodology used to determine the total parking proposed. The methodology should include an analysis of the anticipated parking usage based on

the different types of parking demand (e.g., market residential, affordable residential[3], employee, hotel guest) and projected parking demand at different times of day. Without such an explanation, we are unable to assess whether the number could be reduced to limit environmental impact and to encourage non-auto access to the site.

Shared Parking

To help minimize the amount of parking spaces required, it is essential that a shared-parking approach be utilized. Due to the varying peak times for the multiple onsite land uses (residential, office/lab, retail, and hotel), there is significant opportunity for parking spaces to be shared. The DEIR should include a comprehensive shared parking analysis, and specific plans to implement shared parking with existing or upcoming developers. The City can and should play a key role in helping various developers to implement shared parking across nearby sites. MAPC.5

Provide Infrastructure for Electric Vehicle Charging

At least four percent of the parking spaces should be allocated for electric vehicles, unless the City of Somerville requires dedication of a greater number of spaces. As the Proponent may be aware, Massachusetts is party to a multistate Memorandum of Understanding for an action plan facilitating implementation of zero-emission vehicle (ZEV) programs. The goal is to ensure that there are 3.3 million ZEVs on the roads by 2025, which requires adequate infrastructure, including charging stations. MAPC.6

Lower Mystic Recommendation to Establish Regional Mitigation Fund

MAPC is particularly interested in monitoring the development that takes place for this Project since it is contained within the study area of the Lower Mystic Regional Working Group (LMRWG) www.lowermysticstudy.org. The LMRWG has developed a comprehensive regional land use and transportation study that was required by your office as part of the Encore Boston Harbor MEPA process. This study is in the final stages of approval for public release. Encore Boston Harbor, MassDOT, and the Barr Foundation are funding the Working Group, with MassDOT as the Working Group lead. MAPC is a member, along with the cities of Everett, Boston, and Somerville. In addition, MAPC is providing significant staff support for the Working Group, particularly in regard to deriving policy and planning recommendations based on the modeling conducted by the Central Transportation Planning Staff.

The LMRWG Study specifically anticipated development at the Project site, along with additional growth occurring in this general area, including additional growth in Assembly Square, Sullivan Square, other areas of Charlestown, the Encore Boston Harbor casino and resort, and other parts of Somerville and Everett. Only a truly regional approach can address the traffic impacts that will result from this development.

While additional transportation improvements will be needed, infrastructure alone will not address the anticipated increase in vehicle trips. The mix of uses, the amount of parking, and the TDM actions that property owners will be required to take are all critical to minimizing and mitigating traffic impacts. As one of the first projects to occur within the framework of the

[3] Please note the importance of distinguishing between market and affordable residential, since the residents of affordable units may own fewer cars and take fewer auto trips.

LMRWG Study, it is critical that the Proponent's transportation mitigation program be aligned with the Study's recommendations.

In light of the tremendous growth occurring in this area, the LMRWG Study is expected to recommend establishing a Regional Mitigation Fund, which would enable developers to deposit mitigation funds into a pool for transportation investments. The funds could support improvements to MBTA rapid transit or bus service; regional roads, highways, and bridges; bicycle and pedestrian infrastructure; regional bicycle share systems; or other improvements jointly agreed upon by the Proponent, municipalities, and MassDOT.

One great value of establishing such a fund is that it ensures all future developers will contribute according to reasonable and equitable rules to mitigate the impacts of their projects, rather than burdening the first, the last, or the largest project with all or most of the responsibility. A Regional Mitigation Fund, and the rules guiding contributions to such a fund, can provide predictability to developers, while ensuring full mitigation of negative impacts. It is anticipated that once the LMRWG is Study is adopted, a mechanism to enable the allocation of funds for a Regional Mitigation Fund will be established.

Since we expect the LMRWG Study to be finalized by September 2018 and submitted to your office, we ask that the Proponent take the Study's recommendations into account when preparing the DEIR and ensure that the Project and its mitigation commitments are consistent with the recommendations, including a contribution to a new Regional Mitigation Fund. MAPC.7

<u>Transportation Demand Management Program</u>

It is critical that a robust Transportation Demand Management (TDM) program be designed to minimize automobile usage and project-related traffic impacts. MAPC is pleased that the Proponent has indicated they will implement a comprehensive TDM program for the Phase 1 Project. However, it is imperative that the TDM measures delineated for the Phase 1 Project be extended to the entire Project. Key components of the Phase 1 Project's TDM program include: MAPC.8

Transit Passes

MAPC applauds the Proponent for recognizing that free or discounted transit passes can increase transit ridership and, in turn, reduce travel by private vehicle. As such, the following is proposed:

Employer Transit Passes

Employers will be encouraged to provide a certain level of transit pass or Blue Bike membership as an employee benefit. This will be included as a benefits package, similar to insurance or a gym membership, and can be part of providing a competitive workplace environment to attract talent. For example, this may mean that Union Square employers subsidize a portion of all employee transit passes, or a capped base amount. The actual amount will be developed along with a final parking pricing program.

Resident Transit Passes

With a large concentration of units at Union Square, the Proponent may be able to secure a bulk purchase of transit passes. Passes could be provided at no cost for a set amount of time to new residents to encourage the development of sustainable transit patterns. Providing a

subsidy for residents, particularly new residents who are still establishing travel patterns, can lower a barrier to taking transit (both paying for and obtaining the pass) and encourage people to choose transit over driving.

Additional TDM Strategies
MAPC is also pleased that the Proponent plans to allocate reserved parking spaces for car sharing services such as ZipCar and offer ridesharing through NuRide, the Commonwealth's web-based trip planning and ride-matching service, which enables participants to earn rewards for taking "green trips." In addition, employees at the Phase 1 Project site will have the opportunity to enroll in federally-designated Commute Benefit tax deduction programs.

In addition to the areas described above, TDM components that should be included in the DEIR and Section 61 Findings are: MAPC.9

- Whether the Proponent will partner with an existing, adjacent Transportation Management Association (TMA) or lead the creation of a new Union Square-based TMA.

- Designating appropriate pickup/drop-off locations for taxi and private ride services.

- The DEIR should discuss how tenancy lease agreements or a tenant manual will be used as a mechanism to ensure implementation, maintenance, and success of TDM measures.

Pedestrian and Bicycle Access
In order to reduce traffic and parking demands, the Project needs to promote pedestrian and bicycle travel to the fullest extent possible. MAPC is pleased the Proponent has indicated that the Project will include bicycle facilities on all D Blocks and that streetscape improvements will encourage bicycling and walking.

Bicycle infrastructure is a significant component of the Phase 1 Project, with an estimated 650 bicycle parking spaces planned. Approximately 68 short-term spaces will be provided for customers and visitors, while approximately 492 long-term spaces will address resident and employee needs. Lastly, 90 covered and secure bicycle spaces will be provided to support the Union Square Station operation. When complete, the Project will have 1,900 bicycle parking spaces and two bike share stations. MAPC looks forward to reviewing the Proponent's pedestrian and bicycle plan in the DEIR. MAPC.10

Mode Share Goals and Monitoring Program
MAPC commends the Proponent for its commitment to a 60% non-auto mode share, which incudes the ongoing monitoring of access in conjunction with the City, and increasing TDM mesures as needed to maintain this commitment. This commitment is memorialized in US2's Coordinated Development Plan and Mobility Management Plan. US2 pledges to post-construction monitoring of mode share and adjustment of mobility management measures to ensure compliance with the 60% non-automobile mode share requirement. While the 60% requirement is for the Phase 1 Project, it is critical that this mode share goal be applied to the entire Project. In the DEIR, the Proponent should define mode share goals clearly (vehicular, subway, bus, bicycling, and walking) for residents, employees, and visitors as part of their MAPC.11

commitment to conduct monitoring and reporting, and they should also agree to adjust the project's TDM program as necessary based on monitoring outcomes. MAPC.12

Affordable Housing

MAPC applauds the Proponent for recognizing that maintaining local housing affordability is an important underpinning of economic growth and is a goal in the Union Square Neighborhood Revitalization Plan adopted by the City in 2016. Somerville's inclusionary housing policy dictates that 20% of all housing provided be permanently affordable. Similarly, this policy addresses affordability across a range of income brackets, assigning these units to three distinct income tiers. These tiers, designating units to earners of up to 50% of area median income (AMI) in tier 1, 80% in tier 2, and 110% AMI in tier 3, will serve a broad range of incomes, expanding the way in which the City addresses matters of affordability. Furthermore, 15% of these affordable units will be three-bedroom, deepening the City's commitment to families who desire to call Somerville home. In addition, the Phase 1 Project program will yield approximately $1.5 million in a housing linkage payment, which will be utilized to address other local housing needs.

The Phase 1 Project will construct 90 affordable units and, when fully complete, the Project will provide 183 to 213 affordable units. The Proponent will fund over $10.9 million of housing linkage payments that can be utilized to address other local housing needs.

It is important to note that affordable units may also have an impact on traffic, because the owners or renters of affordable units may own fewer vehicles, generate fewer vehicular trips, and depend more frequently on transit, walking, or biking.

MAPC.1 Coordination with the MBTA in regard to the GLX project.

US2 has been meeting regularly with the MBTA, the GLX contractor, and the City and will continue to meet as designs for Union Square Station and development advance in parallel. Addressing the multi-modal nature of the site is one of several matters of ongoing coordination, whether that be for pedestrians, cyclists, para-transit service passengers, or bus riders. Please refer to Section 1.3 of the FEIR for additional information regarding coordination with the GLX project and Figure 1-9 in the FEIR for additional information regarding D2 site circulation.

In addition, as described in Section 2.4 of the FEIR, US2 is committed to working with all parties, particularly the City and the MBTA, to ensure transit access to Union Square as part of larger overall goals of minimizing auto travel and meeting or exceeding mobility management requirements. While the MBTA controls improvements to their system, US2 has committed to providing the following in support of Union Square Station:

- US2 will contribute approximately $5.8 million to support the GLX development.
- US2 will provide, on the D2 property, improvements to Union Square Station including the following end of line facilities: operator's breakrooms, accessible restrooms, janitor's closet, and The Ride paratransit service drop-off area.
- A permanent easement in favor of the MBTA, for construction and operation, a portion of the GLX Union Square station on a portion of the D2 site.
- ADA-compliant pedestrian path from Union Square Station to the Prospect Street sidewalk to improve pedestrian access to transit.

In addition, US2 has offered land area on D2 to make room for the MBTA's elevator and/or to install a stair to help improve vertical circulation between the station and the Prospect Street bridge. US2 has also offered to contribute to the cost of construction of the MBTA's elevator. US2 will continue to coordinate with the MBTA, the City and other stakeholders on this issue and remains hopeful that a solution to the MBTA elevator can be identified.

MAPC.2 Service improvements for bus lines servicing the site.

US2 is committed to working with all parties, particularly the City and the MBTA, to ensure transit access to Union Square as part of larger overall goals of minimizing auto travel and meeting or exceeding mobility management requirements. While the MBTA controls improvements to their system, US2 has committed to providing the following in support of Union Square Station:

- US2 will contribute approximately $5.8 million to support the GLX project.
- US2 will provide, on the D2 property, improvements to Union Square Station including the following end of line facilities: operator's breakroom, accessible restrooms, janitor's closet, and The Ride paratransit service drop-off area
- A permanent easement in favor of the MBTA, for construction and operation, a portion of the GLX Union Square Station on a portion of the D2 site.
- ADA pedestrian path from Union Square Station to the Prospect Street sidewalk to improve pedestrian access to transit.

The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts. The City has both the ability and the willingness to attempt additional interventions to benefit transit. To fund these potential improvements, the City will allocate a portion of US2's committed offsite infrastructure and future phase contribution monies to rapid-response, short-term mobility and safety retrofits in the Project area to use as deemed necessary. In addition, through the individual plans for each Lot, US2 will work with the City on potential transit improvements proximate to each Lot. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger operations within Union Square, and will be used to help determine future improvements or the success of ones previously implemented.

Section 2.5 of the FEIR provides specific transportation metrics that would suggest when modifications to the transportation system could be implemented to improve the MBTA's bus network, and what those modifications could be. To fund these potential improvements, the Project will allocate a portion of committed offsite infrastructure and future phase contributions to rapid-response, short-term mobility and safety retrofits in the Project area.

MAPC.3 **Improve bus routes for maximize ridership.**

Please see response to comment MAPC.2

MAPC.4 **Present a detailed parking needs assessment.**

As described in Section 2.3 of the FEIR, the basis of the parking demand model used by US2 to evaluate the shared parking strategy described in the DEIR (Section 4.5.6) has been under development with, by, and for the City through multiple processes governing Union Square and beyond, including the Union Square Neighborhood Plan, the CDSP, Union Square Zoning, and the City's Parking Demand Model.

The original analysis and concept for the Shared Parking Model was developed through the Union Square Neighborhood Plan. The Shared Parking Model included a review of potential land use for the entire Union Square Neighborhood Plan area, which extended well beyond the D Blocks included in the Project. It further explored factors to be applied that would reduce overall parking demand and placed them within a Union Square context.

Although the Project is currently anticipated to be developed as phases as described in Section 1.2.3.1 of the FEIR, parking associated with individual Lots will be realized as conditions, needs and opportunities dictate. Parking will be an ongoing consideration, but supply will be provided by Lot as described in Section 1.2.3.1 of the FEIR. As required by Union Square Zoning and codified in the CDSP, all parking will be shared between Project uses and available to the public as determined. All parking, as it is built out, will be gate controlled, with parkers having access through a ticketing or reader card system. See Section 2.3.2 of the FEIR for additional details regarding the management of parking.

MAPC.5 **Shared parking analysis.**

Section 4.5.6 of the DEIR provided a description of the shared parking analysis completed for the Project. The basis of the parking demand model used by US2 to evaluate the shared parking strategy described in the DEIR is the City's parking demand estimator which was used to estimate potential parking demand for the Project based on the proposed program of office/lab, retail, hotel, and residential uses. Section 2.3 of the FEIR provides additional detail on the shared parking analysis methodology.

The approved Union Square Zoning Overlay District includes a carefully considered parking policy that requires a shared parking strategy, permits a maximum of 1,500 total parking spaces, and has no required parking minimum ratios. The proposed Project and its TDM approach is responsive to this policy and includes 1,495 proposed parking spaces. The proposed parking levels are based on developing a mix of Project uses, operating shared parking facilities and the parking management strategy outlined in the DEIR. In an effort to encourage a higher rate of shared vehicle use as requested by the commenter, the Project will provide approximately 14 parking spaces dedicated to car sharing, and US2 has agreed to provide additional incentives for car sharing services for every residential unit.

MAPC.6 **Electrical vehicle parking.**

To encourage the use of Green Vehicles that reduce GHG impacts, the commercial parking in the Project will include the following:

- 72 spaces will be preferred parking spaces for low emitting/fuel efficient vehicles;

- 29 spaces will be provided as carpool parking spaces before 9:00 a.m. on weekdays;
- 38 electric vehicle charging parking spaces will be provided;
- 38 electric vehicle ready parking spaces will be planned; and
- 14 spaces will be provided for car sharing services.

MAPC.7 Consistency with the recommendations from the LMRWG Study.

The Project has been working closely with the City, which is an active participant in the Lower Mystic River Working Group. The final report of the LMRWG was released in the spring of 2019. The Project will continue to work with the City to support the recommendations of the study as appropriate.

MAPC.8 Describe the Transportation Demand Management components.

Incentives related to the Project's TDM program will be implemented in phases as the Project is built-out. These programs are planned to coincide with the development of each Lot to ensure the appropriate programs are effectively implemented for the appropriate uses. Section 4.5.7 of the DEIR described the commitment to mode share goals, the specific TDM measures to be incorporated as part of the Project, and the ongoing monitoring survey and monitoring programs that will be used to evaluate them. The TDM program is anticipated to be consistent for all Blocks, though may be updated based on new or changed information or programs in the future. Additionally, Sections 2.4 and 2.5 of the FEIR provide additional information about the approach to transportation monitoring and mitigation.

MAPC.9 TMA, designated drop-of/pick-up, lease agreements.

As of this filing, US2 is not sure if it will partner with an adjacent TMA or start a new TMA. This will be evaluated further into Project implementation and in consultation with the City.

At the request of MassDOT, US2 spoke with representatives from the Assembly Row TMA and learned about their ongoing efforts to create the Assembly Row TMA and provide TMA services for the Assembly Row district. The parties agreed to connect again later this year after construction has started on the Project to continue the dialogue. The goal of this coordination will be to share best practices, discuss challenges and identify synergies. US2 will continue to consult with MassDOT and the Assembly Square TMA as it implements the Union Square TDM Program.

US2 will collaborate with the City to designate appropriate pickup/drop-off locations for taxi and private rider services as part of the permitting process for each Lot.

Since there will be multiple tenants located within the Project site and within each Lot, MMP obligations will be included to the extent possible as part of the lease language between tenants and the property owner. Verification of the ongoing conformance with this condition will be provided to the City by the property owner either as a copy of the leases (with financial aspects and other non-MMP elements redacted) or via an affidavit signed by the owner and tenant(s) verifying that this language was included and agreed to in the lease. This documentation will be provided to the City prior to the issuance of the Certificate of Occupancy for tenant spaces with 50 or more employees.

MAPC.10 Project bicycle parking.

Section 4.5.4 of the DEIR described the overall bicycle analysis and plan for the Project. Please refer to Figure 1-17 in the FEIR for a plan depicting the overall bicycle infrastructure planned for the Project area.

MAPC.11 Define mode share goals.

The overall mode share goal of the Project is a 60% non-auto mode share. The mode shares were developed in coordination with the City and were defined in Section 4.3.2.3 of the DEIR. The TDM plan described in Sections 4.5.7 and 4.5.8 of the DEIR described the programs to be implemented and the required monitoring and reporting program to be used to achieve these goals.

MAPC.12 Adjust the TDM program as necessary based on monitoring outcomes.

The overall mode share goal of the Project is a 60% non-auto mode share. The mode shares were developed in coordination with the City and were defined in Section 4.3.2.3 of the DEIR. The TDM plan described in Sections 4.5.7 and 4.5.8 of the DEIR described the programs to be implemented and the required monitoring and reporting program to be used to achieve these goals.

The specific mode share goals for vehicles and non-vehicles (transit, bicycle, and pedestrian), as provided in the DEIR, is provided below.

Mode Shares	
Future Vehicle Share	40%
Future Non-Vehicle Share (Existing and Proposed TDM)	60%
Future Transit Share	22%
Future Bicycle Share	15%
Future Pedestrian Share	23%

Based on the results of the monitoring program, the TDM program will be adjusted, as necessary, to meet the mode share goals by encouraging non-vehicular travel.

Wednesday, August 22, 2018

Matthew Beaton, Secretary

Executive Office of Energy and Environmental Affairs
Attn: MEPA Office / MEPA Analyst Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Via email to Mr. Alex Strysky

RE: **EEA#15889, ENF, Union Square Redevelopment, Somerville MA**

Dear Secretary Beaton,

The Union Square Neighborhood Council is a publicly elected representative body created in December 2017 dedicated to serving the Union Square community, addressing the neighborhood's concerns, and advocating for the community member's needs.

We, the Union Square Neighborhood Council (USNC) Board Members, appreciate the work the Proponent, US2 and the Somerville Redevelopment Authority (SRA) have dedicated to creating the extended Environmental Notification Form (ENF) submitted to the Massachusetts Environmental Policy Act for a Phase 1 Waiver Request. Upon thorough review of this document, we would like to submit the following comments regarding the content of the Phase 1 Waiver Request.

A. Phase 1 Waiver Request Reasoning

We understand the concerns raised by the Proponent for requesting a Phase 1 Waiver Request. The primary incentive described as, "deliver[ing] critical components required for the full functionality of the future Union Square Station....include[ing] an Americans with Disabilities Act (ADA) compliant connection from the Prospect Street sidewalk to the new station platform, a drop-off/pick-up area for the MBTA's The Ride paratransit program, sheltered and secure bicycle parking and MBTA end-of-line facilities including an MBTA employee breakroom, janitor closet and restrooms," is appreciated by the Council. We are concerned though, that no legal document has been executed describing such necessity between the MBTA and the Proponent for full functionality of the extension. For the Proprietor to focus heavily on this reasoning as being a burden to a delay in the project, the Council would expect a binding document between the two entities exist to support the necessity for a Phase 1 Waiver. We have asked the Proponent to provide such supporting documentation. Confirmation of the existence of such a document has not been provided to the Council. USNC.1

B. Errors in Waiver Request

Two obvious errors were found in the document supplied by the Proponent that could be crucial to the environmental impact the Project imposes. In EEA #:15032, the original ENF submitted by the Somerville Redevelopment Authority in 2013, the watershed for the project is classified as the "Mystic River Watershed". In this filing, the watershed is erroneously classified as the "Charles River Watershed". This is a crucial detail as the Mystic River Watershed is categorized by the Federal Clean Water Act (CWA) as a § 303(d) pathogen impaired segment in the Draft Pathogen Total Maximum Daily Load (TMDL) Report for Boston Harbor. USNC.2

B. Errors in Waiver Request (continued)

The second error in the Waiver Request is on pg 18 stating, "This AUL [Notice of Activity and Use Limitation] will be retracted as this property [26 Bennett St.] is part of the site remediation and the improvements caused by the cleanup of the adjacent Kiley Barrel site in 2015." The AUL was not actually remediated with the Kiley Barrel Site. The areas cleaned by Kiley Barrel are: 264-266 Somerville Ave., 9 Milk Place, 10 Milk Place, 14 Bennett St., 8 Bennett St., and 20-22 Prospect St. USNC.3

C. Alternatives Analysis

The alternative analyses provided in the Waiver are artifacts from the original process in determining what would be suite the D2 Parcel. The Proponent did not propose these alternatives to the community.

D. Transportation

According to the Proponent, the transportation report submitted in the Waiver only considers the impact of Phase 1 of the Project. The Council would like to see a comprehensive traffic report to determine the cumulative traffic burden Union Square will endure during and after all Phases are complete. Please refer to Section L for further discussion. USNC.4

The Proponent did not discuss transportation concerns with the appropriate MassDOT personnel which could produce errors in the analysis/environmental impact. The Council would like to see that all appropriate personnel are consulted for each matter. USNC.5

E. Infrastructure

The Proponent only considers the impacts of Phase 1 in the infrastructure analysis. The Council would like to know what cumulative impacts the Project would have on infrastructure as it currently exists. USNC.6

The Proponent also does not consider ride shares, The Ride, and deliveries for Massachusetts Stormwater Management Standard #5. The consideration of these in addition to the proposed parking space sharing program the Proponent anticipates would likely equate 1,000 vehicle trips specifically to the Phase 1 Project site. USNC.7

The Council would also like to see a long-term Operations and Maintenance Plan included in the Waiver prior to MEPA's review.

The Proponent does not provide any concepts other than the culvert and 70% permeable surfaces to reduce the amount of stormwater runoff onto adjacent lots. This is concerning to the Council as D2 is identified as a historic flooding area in Union Square. Specifically of concern is the risk of flooding on the Union Square Station due to increased stormwater runoff. The Council would like to see a thorough proposal from the Proponent to minimize stormwater runoff. USNC.8 USNC.9

F. Historic Resources

The Council would like clarification on Figure 8-18. Are the shadows from the proposed buildings significant for a MEPA Threshold? USNC.10

G. Greenhouse Gas Emissions Analysis

The Council would like confirmation that a pool (proposed by the Proponent in May 2018) qualifies as a 'green roof'. USNC.11

G. Greenhouse Gas Emissions Analysis (continued) USNC.12

The Council would recommend the following:

Adding a Nest or thermostat equivalent to the residential units to assist in energy reduction/savings.

Primarily using revolving doors when possible at entrance ways (secondary to ADA considerations).

The Council would like to see the Proponent develop a working relationship and consulting along the process with local universities who are leading innovation in energy conservation and sustainable development. USNC.13

The 2025 Build scenarios presented in the Traffic GHG Results are not accurate because data from the entirety of the Project is considered. There are 3 adjacent parcels that will likely be developed or be in the process of being developed that will significantly change the traffic and GHG emission estimates. USNC.14

The MOVES program is a regional analysis containing 'Super Sights' for a developer's reference. Considering the local changes and total 117 acre redevelopment proposed for Somerville, the Council would prefer to see targeted traffic and GHG emission studies specific to the three cohorts of the total redevelopment in Somerville. MOVES also does not consider the health consequences of Ultrafine Particles emitted from cars. One of the most well known consequences found in humans are respiratory diseases. The City published "The Wellbeing of Somerville Report " in 2017 which defines the morbidity and mortality rate of residents in Somerville, specifically respiratory complications. The Council would like to see the Proponent work with local universities leading the initiative testing epidemiologic consequences from traffic pollution. USNC.15

H. Hazardous Materials

The Council advises the Proponent discuss asbestos clean up in the ENF as the two buildings left on the D2 parcel almost certainly have it in the infrastructure. USNC.16

Provided the extensive history of the 17 RTNs assigned by MassDEP, the Council requests a thorough analysis and remediation plan be submitted to the ENF rather than the 1.5 page overview of the Proponent's incentives to remediate the D2 parcel. USNC.17

TRC released a Phase 5 Status Report (Status Report No. 4) on June 5, 2018 to give an update on the Kiley Barrel Site (RTN 3-2849). In the recent samples collected on the site in April 2018, one groundwater sample resulted in higher concentrations of vinyl chloride. A reason for this increase was determined as 'unknown' in the report. The Council requests the Proponent consider other means of remediation than the proposed vapor mitigation system for this contaminant provided the dangers associated with the chemical. USNC.18

In addition to the increased vinyl chloride concentration follow up, the Council requests the Proponent work with the City to install air monitoring systems in the immediate abutters to the Kiley Barrel Site who have not had air quality and contaminant monitoring. Those abutters are 9 Allen St. and 11 Allen St. USNC.19

Finally, central to the D2 parcel is 26 Bennett St. (RTN 3-29452). This site was last sampled in 2010 when MassDEP filed an AUL on the site. At the time the following contaminants were detected: antimony, barium, cadmium, chromium, lead, nickel, vanadium, zinc, and polychlorinated biphenyls (PCBs).

H. Hazardous Materials (continued)

Most of the contaminants were present 0-3 feet in the soil. A 120-day release condition reported cadmium, chromium, lead, nickel, and zinc in both soil and groundwater on the site. Coal and coal ash were found throughout the property. Further testing confirmed the presence of cadmium and chromium under Bennett St. and zinc in residential soils. The associated risks for these contaminants are provided below:

1. Class A carcinogens via inhalation:
    a. Hexavalent chromium
    b. Nickel
2. Class B1 carcinogens via inhalation:
    a. Cadmium
3. Class B2 carcinogens
    a. Lead
    b. PCBs

At the point of the AUL filing, the primary risks were considered for commercial workers, visitors or trespassers, children, utility workers, construction workers. Their health is likely at highest risk through direct contact and incidental ingestion during construction as well as inhalation of dusts. **The Council requests the Proponent respect the worker's health concerns and appropriately advise the employees to wear sufficient personal protection equipment while working on and adjacent to the site.** USNC.20

All SDS files have been provided via hyperlinks to their respective element/chemical.

The AUL is defined under the condition of "No Significant Risk of Harm to Human Health, Safety, Public Welfare or the Environment" so long as the AUL is implemented. Under the AUL, the site is not suitable for **residential**, child's school, child's daycare, institutional, playground or active recreational use. No gardening of edible produce is allowed. Only commercial, industrial or passive recreational use is permitted as long as soils remain coverence with protective barriers. The Council is concerned some of the current proposed development might contribute to unnecessary exposure to the community health risks if remediation is not efficiently followed through. USNC.21

I. Air Quality

The Council is concerned the MOVES methodology is not an accurate representation of the Air Quality in Union Square, specifically because the Proponent used super sites in Kenmore Square and Harrison Ave. in Boston. These sites do not share similar air quality measurements as Somerville, Everett, Revere, Malden, and Medford do. The Council is requesting the Proponent identify super sites more similar to the concentrations found in Somerville or consult with a local university to study hyper-local gas concentrations in the air. USNC.22

J. Construction Impacts

With consideration of the contamination and health risks for construction workers, the Council is requesting a thorough construction management plan be submitted for each anticipated phase of construction (remediation to interior completion) at the earliest possible time allowable. USNC.23

The Council is also requesting a transportation impact report be generated for Phase 1 and the consecutive Phases to provide an accurate analysis of trips and emissions. USNC.24

K. Special Review Procedure

Based on the original MEPA Environmental Notification Form (ENF) submitted by the Somerville Redevelopment Authority (SRA) in 2013 EEA #:15032, the Union Square Urban Revitalization Plan was intended to encompass 117 acres divided amongst the Prospect/Webster Corridor (Union Square), Boynton Yards, and Medford/McGrath Corridor. Considering the evolution of the project since 2013, it is understandable that US2, the Master Developer for Union Square, would choose to file independent an independent ENF from the Boynton Yards and Medford/McGrath Corridor. The Council requests the Proponent consider re-submitting an ENF through a Special Review Procedure under 301 CMR 11.09. USNC.25

The support for such a request is provided below:

1. Special Review Procedure qualifications
    a. Project in Phases - this Project is currently proposed to be 3 phases
    b. Lapses of time between review documents - this Project is estimated to last 20+ years. If a single EIR is granted by MEPA now and Notice of Project Changes are not necessary, all thresholds will be outdated jeopardizing the sustainability of the development in Union Square.
    c. Shortened or extended review periods - not every parcel is as complicated as D2 but holds their own unique thresholds that should be reviewed by MEPA.
    d. Coordination of MEPA review with other environmental or developmental review and permitting processes - as the original ENF for Somerville Redevelopment describes, there are two other areas adjacent to Union Square that are and will be developed. This would be ideal for each of the developers to use a conglomerate of data and analysis for the area to clearly define the impacts on the neighborhood(s).
2. CAC
    a. The USNC is a 15 member board representing a mandated variety of backgrounds in the community to handle such tasks as the efforts required to fulfill the roles of a CAC for a Special Review Procedure.
3. Segmentation
    a. As stated by MEPA Regulations 301 CMR 11.01(2)(c), "In determining whether a Project is subject to MEPA jurisdiction or meets or exceeds any review thresholds, and during MEPA review, the Proponent, any Participating Agency, and the Secretary shall consider the entirety of the Project, including any likely future Expansion, and not separate phases or segments thereof."
    b. Additionally, as described in this letter, the Council has requested the cumulative data and analyses be submitted for an accurate review.
4. Area-wide Review
    a. This is a Master Developer partaking in a Redevelopment area
    b. One of the biggest items lacking in this Waiver Request are alternatives to the proposed Project. It could be of benefit to the Proponent to file under an area-wide review for assistance.

Overall we, the Council, are pleased to see that the Proponent has made progress on data collection and analysis to submit to MEPA. At this point in time, we do not believe the data are sufficient and the analyses are accurate enough to support a Phase 1 Waiver Request. Furthermore, due to the extensive history of contamination at the site, we request that a full EIR or Special Review Procedure be completed to ensure all thresholds are reviewed and environmental and public health impacts are completely considered during this redevelopment.

Please do not hesitate to contact the Council with any questions or concerns.

Sincerely,

The Union Square Neighborhood Council

Afruza Akther
Tori Antonino
Ben Baldwin, Secretary
Joanne Berry, MEPA comment author
Ben Bradlow
Ann Camara
Bill Cavellini, Co-Chair
Mike Firestone
Michèle Hansen
Jacob Kramer
Andrea Lizama
Erik Neu
Pennie Taylor, Treasurer
Ganesh Uprety
Rachel Weil, Co-Chair

USNC.1 Documentation of the MBTA extension improvements.

The City, the MBTA, the GLX contractor and US2 have been regularly meeting since July of 2018 and will continue to do so in coordination of logistics, schedule, staging, access, neighborhood impacts and other matters as work proceeds. All parties share the goal of the successful delivery of the Green Line to Union Square. The parties are actively engaged in coordinating timely delivery of station elements given the evolution of project schedules since the ENF was filed.

US2 has agreed to the delivery of the improvements to support the station as described in the DEIR and FEIR, and as outlined in a Letter of Intent dated August 24, 2018 between the parties. With MBTA station components (janitor closet, break room, restrooms, The Ride Drop-off, bicycle parking spaces, etc.) provided by US2 on what will be private property, the necessary easements to provide for MBTA use of these improvements will only be finalized when the final locations are determined. Expanded detail of the coordination efforts has been provided in Section 1.3 of the FEIR.

USNC.2 Watershed.

The Major Watersheds data layer produced by the Massachusetts Bureau of Geographic Information locates the Project site within the Charles River Watershed.

USNC.3 Remediation of 26 Bennet Street.

The 26 Bennet Street site was remediated separately from the Kiley Barrel site. One AUL has been recorded against a portion of D2 which is associated with a release of metals identified by RTN 3-29452. The AUL covers the 26 Bennett Street parcel in the eastern central portion of D2. In August 2010, five metals including cadmium, chromium, lead, nickel, and zinc were detected in soil at the property at concentrations exceeding the applicable MCP RCS-1 standards. In addition, lead was detected in groundwater at concentrations greater than the applicable MCP RCGW-2 standard. In October 2011, a Phase I Initial Site Investigation and Class A-3 RAO (Permanent Solution) were submitted to MassDEP. The Class A-3 RAO was supported by a Method 3 Risk Characterization and relies on the implementation of an AUL. The existing AUL prohibits use of the AUL area as a residence, school, nursery or daycare, and restricts the growth of produce for human consumption and active recreational uses. The AUL requires that the protective barrier (e.g., pavement or two inches of gravel) be maintained to prevent exposure to soils containing elevated levels of metals that remain on site. Under the AUL, construction can occur provided a soil management plan (SMP) and health and safety plan (HASP) are prepared by a Licensed Site Professional (LSP).

USNC.4 **Traffic report.**

A TIA for the entire Project was provided as Chapter 4 of the DEIR, and includes an assessment of vehicle, transit, pedestrian and bicycle impacts following the full build-out of the Project.

USNC.5 **Coordination with MassDOT.**

The Project team met with MassDOT prior to the filing of the ENF and since that time has continued consultation with various MassDOT units as well as the MBTA Service Planning Department. Several consultation meetings have been held with MassDOT units as part of US2's MEPA review. In March 2018, US2 met with Lionel Lucien of MassDOT prior to the ENF filing to discuss the overall Project and the approach to transportation management. In November 2018, US2 met with MassDOT to review the development of the TIA and review their comments on the ENF. More recently, US2's team met with MassDOT to discuss their comments on the DEIR. Additional conversations with MAPC, CTPS and the MBTA completed both by the City and US2 have helped inform the specifics of the TIA included in the DEIR. US2 has also met numerous times, and continues to meet, with the GLX project team to coordinate design and construction. See also the response to comments from MassDOT, as set forth in Chapter 6 of the FEIR.

USNC.6 **Infrastructure impacts.**

The DEIR includes the entirety of the Project. Although the Project will be designed and developed on a Block-by-Block or Lot-by-Lot basis, the entirety of the Project has been included in the DEIR analyses, including the Infrastructure analysis.

USNC.7 **Massachusetts Stormwater Management Standard #5.**

If more than 1,000 vehicle trips that will park on the site are generated, the overall Project will be considered a land uses with higher potential pollutant loads (LUHPPL). The final design of the stormwater management system will incorporate best management practices to meet Standard #5 requirements as required. The stormwater system will be designed Block-by-Block or Lot-by-Lot with each in compliance with the MassDEP Stormwater Management Standards to the maximum extent practicable.

Additional details regarding the Project's approach to stormwater management can be found in Chapter 9 of the DEIR and Chapter 4 of the FEIR.

USNC.8 **Stormwater runoff.**

All stormwater management facilities will be designed in accordance with the Massachusetts Stormwater Management Standards to the maximum extent practicable.

Chapter 9 of the DEIR included information on the Project's compliance with Stormwater Management Standard #9, Long-term operations and maintenance plan.

A long-term Operations and Maintenance Plan for all stormwater best management practices (BMPs) will be included in each Stormwater Management Report for the individual Lot stormwater designs. Each individual stormwater design will be filed as part of the City's permit review. Therefore, the Project will comply with this standard.

The Project will include a number of additional low impact development (LID) measures, where feasible and practicable. Buildings may be designed to incorporate blue and/or green roof technology to temporarily store stormwater, combined with rainwater harvesting for irrigation. Permeable pavement will be installed in portions of the proposed hardscape areas where appropriate and feasible to promote infiltration and groundwater recharge. Additionally, rain gardens will be constructed in select areas and where feasible to promote water quality treatment and groundwater recharge.

USNC.9 Union Square Station Runoff

Stormwater management facilities will be implemented on a Block-by-Block or Lot-by-Lot basis and will conform to all Stormwater Management Standards within the Massachusetts Stormwater Handbook to the maximum extent practicable. These on-site mitigation measures will decrease the peak rate of runoff for all storms up to and including the 100-year storm event. By doing so, these on-site measures will provide relief to the existing (and proposed) City infrastructure that currently experiences surcharge and flooding during large scale storm events. Stormwater measurement measures on D2 are discussed in Section 4.3 of the FEIR and shown on Figure 4-1 in the FEIR.

The Project will include a number of additional low impact development (LID) measures, where feasible and practicable. Buildings may be designed to incorporate blue and/or green roof technology to temporarily store stormwater, combined with rainwater harvesting for irrigation. Permeable pavement will be installed in portions of the proposed hardscape areas where appropriate and feasible to promote infiltration and groundwater recharge. Additionally, rain gardens will be constructed in select areas and where feasible to promote water quality treatment and groundwater recharge.

USNC.10 Shadows.

Regarding Figure 8-18 of the DEIR, shadows from proposed buildings do not relate to a MEPA threshold, but are provided to illustrate potential impact (if any) on historic resources.

USNC.11 **Pool as Green Roof.**

The pool as proposed by US2 in May 2018, does not preclude a 'green roof'. A green roof for sustainable purposes (under the Leadership in Energy and Environmental Design [LEED] rating system) is a roof that contributes to the reduction of the urban heat island effect. Solar Reflectance Index calculations of roof surfaces assess contributions to combatting the urban heat island. A pool would not be included in this calculation. That being said, a pool would serve as a heat sink and act in the 'eyes of LEED' as an appurtenance to the sun, in the same way that mechanical equipment over a roofing membrane would.

USNC.12 **Design measures to reduce greenhouse gas emissions.**

These suggestions have been noted and will be considered as the designs of the buildings advance. The optimization of energy performance will be a key component of delivering every building. Energy savings will be pursued on a building by building basis. Table 7-1 on page 7-4 of the DEIR provided a summary overview of mitigation technologies based on building typologies, and the Chapter 3 of the FEIR further outlines US2's evaluation of GHG emissions and for mitigating the same.

USNC.13 **Local energy conservation and sustainable development programs.**

US2 has and will continue to make use of the abundance of knowledge and resources afforded by the surrounding area. Similarly, US2 will continue to engage professional sustainability consultants experienced in executing sustainable strategies in a competitive market place to ensure continued environmental stewardship on a building by building basis. For example, as part of its Passive House analysis, described in Section 3.4 of the FEIR, US2 interviewed a number of local market Passive House experts (contractors, architects, developers) and also met with representatives from incentive programs to further understand market-wide resources aimed at closing the cost gap.

USNC.14 **Traffic-related greenhouse gas emissions estimates.**

The transportation-related GHG analysis for the Project was prepared in accordance with the MEPA GHG Policy, and includes only the subject Project. Through coordination with MassDOT and the City and a review of recent developments, two additional development projects were deemed to be of sufficient size to be accounted for in the planning horizon as additional growth included in the DEIR's TIA (and therefore the GHG analysis) and are listed below. Any additional area developments are assumed to be accounted for in the assumed background growth rate. The two projects are:

- Boynton Yards: Proposed 425 residential units and 570,000 sf of commercial development within a 3.44-acre parcel located between Windsor Street, Harding Street, and South Street in Somerville.

- 515 Somerville Avenue: Proposed 164-room hotel at 515 Somerville Avenue.

USNC.15 Ultrafine particles.

US2 is aware of the concern regarding ultrafine particles, and continues to evaluate measures to minimize the impact of vehicle-related pollutants on users of the Project site, including designing horizontal and vertical separation between the D2 civic open space and vehicles, as well as the strategic placement of vegetation.

The D2 plaza is part of the initial Project phase, and since the ENF was filed US2 has been refining D2's design through the City's DSPR process. As part of the D2 planning process, notwithstanding the fact that the location of the D2 plaza was previously evaluated and approved as part of the CDSP process, certain community members suggested that the design of the plaza should be significantly revised in light of concerns regarding pollution impacts from vehicles on Prospect Street. More specifically, these members of the community suggested that US2 consider an alternative plan that would require a significant reconfiguration of the D2 design, an amendment to the CDSP, to accommodate a proposal to move the D2 parking structure underground, situate the plaza in the center of the D2 site and locate a building between Prospect Street and the plaza. It was suggested that this reconfigured design would serve to minimize certain vehicular pollution impacts on users of the plaza.

As noted in the DEIR, US2 has studied the community proposed alternative, evaluated 'pros' and 'cons', and estimated the cost of the underground parking solution. One of the 'cons' identified was that the revised plaza location is not centered on the pedestrian access to Union Square Station, and the reconfiguration would require pedestrians accessing the station via the 'at grade' accessible route to travel further. The reconfigured design would also result in making the plaza area less visible from the street, potentially creating concerns about whether users of the space would perceive it as secluded or unsafe.

To further understand the alternative design proposed by certain members of the community, the City hired a third-party construction estimating consultant to estimate the cost of the alternative and some variants. Ultimately, the premium cost of the alternatives was cost prohibitive. The Project is not able to absorb the additional cost, in addition to all of the other Project benefits outlined herein, and remain financially viable. Project feasibility is further challenged by increased risk, significant schedule delay and design challenges associated with implementation of the alternative plan.

Given the challenges associated with moving the parking underground on D2, and the infeasibility of that approach, which would result in significant delays and substantial costs, US2 revised the civic open space design in other ways to make it more resilient to vehicular pollution impacts. The width of the D2 civic open space has been increased to create greater horizontal separation from the civic open space areas most likely to be

populated by pedestrians to Prospect Street vehicles. The elevation of the plaza has also been set at approximately the same elevation as the adjacent Union Square Station, allowing the southern approximately 150 feet of the plaza to benefit from being more than seven vertical feet below Prospect Street. The largest portion of the plaza, where people are most inclined to congregate, is at the southern end of D2 and benefits from the most vertical separation from Prospect Street (approximately 10 to 14 vertical feet). A vegetated landscape buffer has also been planned between the Prospect Street sidewalk and the main pedestrian areas of the plaza to further separate main pedestrian areas on the plaza from vehicles. Additional information regarding the D2 civic open space can be found in Section 1.2.4.4 of the FEIR.

USNC.16 Asbestos.

The two buildings referenced as standing on D2 have since been abated and demolished by the City. On the balance of the development sites and since many are privately owned, US2 is unable to ascertain the presence, or lack thereof, of asbestos on a site by site basis. If additional asbestos abatement is required, it will be carried out with all necessary local approvals and in accordance with prior notification to the MassDEP and the Department of Labor Standards as required by the Commonwealth of Massachusetts on a site-by-site basis as the individual building projects are implemented.

USNC.17 Site remediation.

Chapter 8 of the DEIR included information about site conditions based on best available information, and the anticipated plan for the applicable sites to achieve a level of No Significant Risk. It should be noted that since the Proponent does not own the sites, detailed data collection cannot be completed at this time. Specifically, the anticipated assessment and remediation approaches are outlined for each Block in the following sections of the DEIR: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7 Block: 8.8.3. As development of each Lot is pursued, US2 will pursue property land control, will collect additional site data and will refine its remediation approaches accordingly.

USNC.18 Alternative remediation methods.

Alternative remediation methods will be considered based on further evaluation of the release. It should be noted that remedial additives including emulsified vegetable oils have been applied at the site to treat CVOCs in groundwater associated with the Kiley Barrel site. US2 will continue to evaluate whether additional remedial additive injections and/or other remedial measure could be implemented at the site. In addition, it should be noted that sub-slab vapor barriers and venting systems are commonly implemented at CVOC sites as standard practice, and these exposure mitigation measures have been shown to be very effective. For each D Block, a specific

strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk.

USNC.19 **Air monitoring systems.**

Section 8.9 of the DEIR included information regarding air monitoring and the status of existing systems. Additional air monitoring will be performed based on further evaluation of the nature and extent of the release, including those residences which may have not been assessed previously.

USNC.20 **Construction employees' protection equipment.**

The proposed redevelopment will be managed in a manner that ensures the protection of health, safety, public welfare, and the environment. An LSP will be involved during the design and construction phase for each Lot to provide input on design considerations and to oversee Massachusetts Contingency Plan (MCP) response actions during redevelopment. Conditions of the RAM Plans will include the requirement to prepare a HASP by a Certified Industrial Hygienist (CIH) and that all construction workers that come in contact with contaminated media should have proper Hazardous Waste Operations and Emergency Response (HAZWOPER) training. The HASP will identify practices to ensure worker safety for physical hazards at the site as well as potential exposures to chemical hazards from construction materials and COCs. The HASP will include requirements for personal protective equipment necessary to perform the work. These requirements will vary depending on the specific environmental conditions at a particular Block or building.

USNC.21 **Community health measures.**

Chapter 8 of the DEIR included information on the existing site conditions and anticipated plan for the applicable sites to achieve a level of No Significant Risk. Specifically, the assessment and remediation approaches are outlined for each Block in the following sections: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7 Block: 8.8.3. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. In cases where existing AULs are present, construction will be performed in a manner that is consistent with the AULs and therefore protective of human health and the environment. In addition, construction will be performed consistent with all local, state, and federal regulations. As outlined in Section 8.10 of the DEIR, if a change in use is contemplated, then additional assessment and remediation will be performed as necessary to support the change in use, and the existing AULs will be modified or terminated with a new AUL

recorded to allow the change in use to occur. As discussed in Chapter 8 of the DEIR, where necessary, US2 anticipates implementing perimeter dust and/or air quality monitoring during construction to maintain dust levels below allowable thresholds (in accordance with the Project documents - such as a RAM Plan).

USNC.22 Air quality.

Chapter 5 of the DEIR included a mesoscale analysis, as required by the MEPA Certificate and MassDEP comments, using methodology prescribed by MassDEP. The methodology is consistent with that used for similar projects within the Commonwealth. The mesoscale analysis discloses the NOx and VOC emissions predicted to be created by the new vehicle trips generated by a project, and is provided in order for MassDEP to determine if the emissions are consistent with the State Implementation Plan (SIP), which is the Commonwealth's stated approach to ensuring that the concentration of air pollutants do not exceed the National Ambient Air Quality Standards. The monitoring information from the MassDEP monitoring sites in Boston is not used in the mesoscale analysis and was provided in the ENF for informational purposes only. Additional air quality analyses were not required by the DEIR or ENF Certificates.

USNC.23 Construction impacts.

Construction Management Plans (CMPs) will be submitted and reviewed by the City for each construction phase in order to manage and mitigate temporary construction period impacts. The CMPs are intended to proactively identify and address the potential impacts on the neighborhood that may arise during the construction process of each construction phase and to minimize these impacts where possible. The CMPs will include information regarding the construction activities, specific mitigation measures, construction access, staging and logistics. All contractors and subcontractors will be required to comply with the details and conditions of the approved CMPs. Chapter 12 of the DEIR included more information about construction-period impacts and proposed mitigation.

USNC.24 Transportation analysis.

Chapter 4 of the DEIR included a TIA for the full build-out of the Project.

USNC.25 Special Review Procedure.

The Project has been subject to extensive public review, both as part of the MEPA process and through other lengthy public meetings, discussions, hearings and evaluations. The Project has evolved through input form this extensive process, and is consistent with and derived from Somerville's recently completed Union Square Neighborhood Plan. The Neighborhood Plan sets a vision for Union Square and the Project based on community-based values. This includes a very intentional approach to

mobility and transportation management that privileges pedestrians, transit riders, and cyclists over vehicles to create a walkable, vital employment center. The Project is also consistent with the adopted comprehensive Master Plan of the City of Somerville (*SomerVision*). Other prior completed public processes include those around adoption of the Union Square Overlay District Zoning, and the issuance of the CDSP for the Project, by the Somerville City Council (then known as the Board of Aldermen) and the Somerville Planning Board, in each case after extensive public hearings and input.

The Proponent is pursuing the MEPA process in accordance with State regulations and the process required for completion of the environmental review contemplated by MEPA. The process being completed under MEPA to disclose and seek to mitigate or eliminate environmental impacts from the Project is designed to provide the information that will allow state agency actions to commence. Further and more specific detailed reviews of the development Lots will be completed during the City's DSPR process for each building, civic open space and roadway project, which process will require multiple rounds of neighborhood meetings, design review meetings, public hearings before the Somerville Planning Board, and extensive staff review by the City, and this further review will allow for details about the development of each Lot to be reviewed by the public and City through the required public review process. Additional information about the DSPR public review process is provided in Section 1.6 of the FEIR.

City of Cambridge Comments on the Environmental Notification Form for EEA 15889 - Union Square Redevelopment

Project Site and Context

The project Proponent (Union Square RELP Master Developer LLC (US2) and Somerville Redevelopment Authority) have submitted an Environmental Notification Form (ENF) for constructing 17 new buildings and the renovation of one building, totaling almost 2.4 million square feet of development in multiple phases over 15.7 acres in Union Square. The development is intended to be mixed use and implement "pedestrian-first" planning. It includes 3.5 acres of environmentally contaminated land. The ENF states that this project was spurred by the $2.3 billion Green Line Extension (GLX) project. In general, we support the initiative taken in this development project to minimize automobile vehicle trips and environmental impacts on the surrounding area.

We recognize that there are significant investments being made by the Proponent towards the GLX (both direct monetary and in-kind facility contributions) and the Somerville Avenue Utility and Streetscape Improvements project (a $63 million investment). In addition, during the zoning approval process, we note that the developer committed to a number of specific items. We support these investments but would like to comment that they could be summarized more clearly and succinctly in the ENF. For example, the developer is required to install two new bike share stations and provide amenities as feasible at bus stops, but limited or no information is provided in the ENF on these commitments. CC.1

Even with the significant investments detailed in the ENF and other documents, it is not as clear in the ENF how the developer is more comprehensively investing in efficient bus connections to the GLX, improving through bus service, or improving pedestrian and bicycle facilities throughout the site. It is important to note that many people traveling to and from Cambridge and Union Square may not be using the Green Line or the new GLX station at Union Square. We wish to emphasize the importance of detailing commitments to improving bus, bicycle, and pedestrian improvements and showing supporting data that ensures that the project will realize the proposed 60% non-automobile mode share. This mode share will be critical to reducing the effects of congestion on Cambridge roadways and negative environmental impacts due to increased trips from the development. CC.2

Transportation Impacts

The project proposes 1,500 parking spaces in the built condition (1,245 of which are commercial). While the final number of parking spaces will result in an increase of 1,198 over the existing condition, the ultimate parking ratio does not appear to be greater than recent parking ratios approved in Cambridge development projects, although it is difficult to fully understand without seeing a detailed development proposal with a breakdown of parking and square feet by land use. The Mobility Management Plan includes market rate parking fees, including daily pricing, for employees and residents charged separately from rents, which is

one of the most effective ways to reduce auto trips; the ultimate mode share depends upon the ability of the City of Somerville to successfully negotiate for the inclusion of these parking policies. It is an excellent approach to build more bike parking than vehicle parking in Phase 1 to encourage Union Square users to establish a bicycle habit from the beginning, and give the developer a chance to see how few parking spaces may be needed as they proceed to later development phases. Because the approved number of parking spaces is a maximum rather than a minimum, it is conceivable that the developer could reduce the number of spaces at full build-out. In a similar fashion, Phase 1 parking is all publicly accessible spaces, while use-specific accessory parking spaces are planned for a later phase, again giving the developer an opportunity to reevaluate the approach to parking. At full build-out, the vast majority of parking spaces will be publicly accessible, with only a small portion reserved for accessory uses, which allows the parking ratio to shift flexibility among the employees, residents, and visitors. Lastly, by wrapping parking in ground-floor retail uses and building above parking, the project eliminates nearly all surface parking and other paved areas, bringing the end total down to .5 acre.

Even with the progressive approach to parking, the project is estimated to produce 9,770 total adjusted new vehicle trips per day. The estimated results are significant increases (20-35%) on roadways feeding into and out of Cambridge. Phase 1 alone will add 290 new commercial parking spaces and 2,100 new vehicle trips on the roadway network per day. The ENF indicates that the project will meet or exceed the following two transportation thresholds:

- [301 CMR 11.03(6)(a)(6)] -- Generation of 3,000 or more new ADT on roadways providing access to a single location.
- [301 CMR 11.03(6)(a)(7)] – Construction of 1,000 or more new parking spaces at a single location.

While the project is not estimated to generate enough new bus trips to reach crush capacity, the quality of the bus system may be deteriorated by project generated trips contributing to roadway congestion. Even with the completion of the GLX project, efficient, reliable bus CC.3
connections both to the GLX station as well as throughout the area will be critical to mitigating the traffic and travel impacts of the project on adjacent communities. High quality pedestrian CC.4
and bicycle facilities, including amenities to increase the comfort of these modes, are also critical.

<u>Mitigation</u>
We offer the following specific comments:

- The GLX station will be best served by efficient access by walking, cycling, and bus transit. We urge the Proponent and developer to ensure that the designs and CC.5
investments prioritize this access from all directions, including from Cambridge (such as northbound on Prospect Street). This includes direct and efficient access by foot and

bike, as well as enough space to accommodate for efficient bus transfers to GLX while also accommodating through transit travel and bus-to-bus transfers.

- For Phase 1 alone, Webster/Prospect/Concord will deteriorate from Level of Service (LOS) E to F in the AM, which will add to congestion in Cambridge. This intersection currently carries the CT2 and 85, and in the near future will carry the 91. Combined, there are a significant number of transit riders (approximately 5,000 weekday trips on the entire lines) that could be impacted by additional congestion. We urge the Proponent to invest in additional bus priority improvements at this intersection and at other congested locations in the development area (note that Somerville recently implemented a bus lane northbound on Prospect Street approaching Union Square). The investments could include transit priority lanes as well as signal priority. CC.6
- We urge the Proponent to investment in more than minimum amenities at bus stops and in areas where transfers between buses and the GLX will be mixed with pedestrians traveling through and lingering in the area. The developer should provide sufficient space on sidewalks to comfortably accommodate the high pedestrian volumes expected, as well as for shelters, additional seating and real-time information at bus stops. CC.7
- We support the requirement to install two new bike share stations on the development site, but it would be helpful to better understand the location (e.g. preferably off-street in a visible, accessible location) and timing of installation of these stations. CC.8
- We understand that the City is investing in significant pedestrian and bicycle improvements on Somerville Ave, and we urge the Proponent to extend those treatments consistently throughout the entire development site. CC.9

Conclusion

We support the Proponent's approach to major mixed-use development and pedestrian-first planning approximate to transit with a progressive approach to parking strategies. As with any development, without the appropriate and commensurate investments in safe, comfortable, and efficient access by sustainable modes, this project might lead to significant new vehicle trips in Cambridge and Somerville on already congested roadways. Even with the many investments already discussed, there is still estimated to be a significant impact of new vehicle trips on Cambridge roadways. Because of the extent of the potential impact, we make the above suggestions to ensure the realization of the 60% nonauto mode share. Early investments in improving delay and reliability for local buses and direct, convenient, and comfortable access for pedestrians and cyclists are critical to reaching the mode share goals. We appreciate the opportunity to make these comments.

CC.1 Zoning commitments.

Chapter 5 and Table 1-2 of the FEIR include a summary of both specific transportation mitigation, and the Project's overall contribution to and participation in larger infrastructure improvements being completed by the City. In many cases, such as final location of bus stops, and location of bikeshare facilities, specific design level improvements will be determined through the DSPR process for each individual Block or Lot. All improvements will be completed following the principles, guidance and policy established through zoning, previous agreements, and ongoing coordination. As it relates to the bike share facilities specifically, the first bike share station will be delivered before a Certificate of Occupancy is granted for the fourth building at a location to be approved by the City. The second bike share station will be delivered before a Certificate of Occupancy is granted for the sixth building.

CC.2 Public transportation improvements.

Section 4.5.3 of the DEIR included an innovative evaluation of bus capacity and anticipated Project-generated impacts relative to the rider Comfort Metric as defined through the MBTA's Service Delivery Policy. Completed at the request of and in cooperation with the MBTA/MassDOT, this new analysis is meant to identify specific issues and challenges which can be addressed through ongoing processes. The Project has been, and will continue to work with the City, the MBTA and others to support bus service improvements. These include engagement in the Better Bus project, implementation of the bus lane on Prospect Street, overall roadway and traffic signal modifications and bus stop improvements.

US2 is committed to working with all parties, particularly the City and the MBTA, to ensure transit access to Union Square as part of larger overall goals of minimizing auto travel and meeting or exceeding mobility management requirements. While the MBTA controls improvements to their system, US2 has committed to providing the following in support of Union Square Station:

- US2 will contribute approximately $5.8 million to support the GLX project.
- US2 will provide on the D2 property improvements to the Union Square Station including the following end of line facilities: operator's breakroom, accessible restrooms, janitor's closet, and The Ride paratransit service drop-off area
- A permanent easement in favor of the MBTA, for construction and operation, a portion of the GLX Union Square Station on a portion of the D2 site.

- ADA pedestrian path from Union Square Station to the Prospect Street sidewalk to improve pedestrian access to transit.

- Provision of 120 bicycle parking spaces for the MBTA adjacent to Union Square Station, with 90 of these enclosed in a sheltered and secured facility.

The FEIR also includes detailed plans of proposed vehicular, pedestrian and bicycle access to Union Square Station, including on Figures 1-8 and 1-9, as well as a discussion of US2's efforts to work with the GLX project team to allow the MBTA to incorporate an elevator into its project. These efforts have included offering to provide, at no cost to the MBTA, easements right to accommodate the MBTA elevator, and to contribute to the cost of the installation of the MBTA elevator. See also the response to comment MEPA.22 in Chapter 6 of the FEIR.

The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts. The City has both the ability and the willingness to attempt additional interventions to benefit transit. To fund these potential improvements, the City will allocate a portion of US2's committed offsite infrastructure and future phase contribution monies to rapid-response, short-term mobility and safety retrofits in the Project area to use as deemed necessary. In addition, through the individual plans for each Lot, US2 will work with the City on potential transit improvements proximate to each Lot. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger operations within Union Square and will be used to help determine future improvements or the success of ones previously implemented.

Section 2.5 of the FEIR provides specific transportation metrics that would suggest when modifications to the transportation system could be implemented to improve the MBTA's bus network, and what those modifications could be. To fund these potential improvements, the Project will allocate a portion of committed offsite infrastructure and future phase contributions to rapid-response, short-term mobility and safety retrofits in the Project area.

CC.3 Traffic impact on buses.

US2 understands the concerns raised about traffic congestion potentially inhibiting bus operations. Although US2 does not have the ability to control bus operations, these concerns have been raised with the City and the MBTA. The MBTA is currently undergoing evaluations of bus services throughout its system to identify areas in need of improvement. The bus evaluation in the DEIR provided information to the MBTA regarding bus service through and adjacent to Union Square, and it is anticipated that this information will help inform the MBTA regarding issues of concern in the area, and areas where additional operational efficiencies may be required.

Section 2.5 provides a description of potential interventions to improve MBTA bus service in the study area. The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts. The City has both the ability and the willingness to attempt additional interventions to benefit transit. To fund these potential improvements, the City will allocate a portion of US2's committed offsite infrastructure and future phase contribution monies to rapid-response, short-term mobility and safety retrofits in the Project area to use as deemed necessary. In addition, through the individual plans for each Lot, US2 will work with the City on potential transit improvements proximate to each Lot. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger operations within Union Square and will be used to help determine future improvements or the success of ones previously implemented.

CC.4 Pedestrian and bicyclists amenities.

The Project is designed to encourage a walkable, bikeable, transit-oriented environment in Union Square. The DEIR describes the Project design, programs and implementation needed to ensure the implementation of high-quality multimodal facilities, including:

- Smaller blocks, which encourage walking and biking by providing short, direct connections.
- Density around the forthcoming Green Line station, which will encourage ridership as more people have easy access.
- Pedestrian accommodations and site through-connectivity, which prioritizes pedestrian pathways and makes walking the most convenient choice for access.
- A shared parking approach, which maximizes the use of each parking space and commits more of the development to uses other than private vehicle storage.

Also, Figure 1-17 in the FEIR depicts the bicycle infrastructure planned for the area, and Figure 1-12 in the FEIR depicts the open space, public realm and pedestrian connection network.

CC.5 Connection to the GLX project.

US2 maintains a long history of coordination with the GLX project. Most recently, US2 has been meeting regularly with the MBTA, the GLX contractor, and the City and is working with the parties to ensure that the design for D2 and Union Square Station provide access solutions from all directions.

US2 is continuing its consultation with the MBTA, City and the GLX project team regarding access to Union Square Station from the Prospect Street bridge for MBTA patrons. This is particularly important for the station service area to the south of the station that includes portions of Somerville and Cambridge. In order to contribute to improving circulation from the station to the Prospect Street bridge, US2 has offered to amend the D2 design to provide, at no cost to the MBTA, easement rights on the D2 property as required to make way for the MBTA elevator and/or to install a stair adjacent to the MBTA elevator location. US2 has also offered to contribute to the cost of the MBTA elevator's installation. US2 will continue to coordinate with the MBTA, the City and other stakeholders on this issue. See also the response to comments from MassDOT, as set forth in Chapter 6 of the FEIR, as well as Chapter 1.3 of the FEIR which outlines GLX coordination efforts.

CC.6 Additional bus priority improvements.

US2 is committed to working with all parties, particularly the City and the MBTA, to ensure transit access to Union Square as part of larger overall goals of minimizing auto travel and meeting or exceeding mobility management requirements. While the MBTA controls improvements to their system, US2 has committed to providing the following in support of Union Square Station:

- US2 will contribute approximately $5.8 million to support the GLX project.
- US2 will provide on the D2 property improvements to the Union Square Station including the following end of line facilities: operator's breakroom, accessible restrooms, janitor's closet, and The Ride paratransit service drop-off area
- A permanent easement in favor of the MBTA, for construction and operation, a portion of the GLX Union Square Station on a portion of the D2 site.
- ADA pedestrian path from Union Square Station to the Prospect Street sidewalk to improve pedestrian access to transit.

The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts. The City has both the ability and the willingness to attempt additional interventions to benefit transit. To fund these potential improvements, the City will allocate a portion of US2's committed offsite infrastructure and future phase contribution monies to rapid-response, short-term mobility and safety retrofits in the Project area to use as deemed necessary. In addition, through the individual plans for each Lot, US2 will work with the City on potential transit improvements proximate to each Lot. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger operations within Union Square

and will be used to help determine future improvements or the success of ones previously implemented.

Section 2.5 of the FEIR provides specific transportation metrics that would suggest when modifications to the transportation system could be implemented to improve the MBTA's bus network, and what those modifications could be. To fund these potential improvements, the Project will allocate a portion of committed offsite infrastructure and future phase contributions to rapid-response, short-term mobility and safety retrofits in the Project area.

CC.7 Bus stop amenities and sidewalk space.

US2 has committed to improving accessibility and comfort in coordination with Somerville's Director of Transportation & Infrastructure, to the extent practicable, at each building site that shares frontage with an existing MBTA bus stop. As plans are submitted for each Lot, US2 will work with the City and the MBTA on the location, potential improvement and design of bus stops per the then current MBTA plan and City and MBTA design guidelines. As it relates to pedestrian comfort, the Project by its design is increasing sidewalk space along all zoning defined 'Pedestrian Street' by setting buildings back to allow sidewalks with a minimum width of 12 feet. These expanded sidewalks significantly improve the existing condition, providing a network of generous pedestrian access to and from existing and future neighborhood nodes. Pedestrian access is further supported by approximately 113,600 sf of high-quality civic open spaces that serve as extensions of the public realm to provide pedestrian connectivity to neighborhood opportunity. Page 4-92 of the DEIR provided a list of the locations of these improvements.

CC.8 Location of bike share stations.

The Project is committed to the implementation of at least two bike share stations and associated bicycles in conjunction with Project buildout. The location of bike share facilities, and other specific design level improvements will be determined through the DSPR process(es) as the Project develops, and will be completed following the principles, guidance and policy established through zoning, previous agreements, and ongoing coordination. As it relates to timing of delivery, the first bike share station will be delivered before a Certificate of Occupancy is granted for the fourth building. The second bike share station will be delivered before a Certificate of Occupancy is granted for the sixth building.

CC.9 Extend pedestrian and bicyclist amenities through the entire site.

The Project is designed to encourage a walkable, bikeable, transit-oriented environment in Union Square. The DEIR described the Project design, programs and implementation needed to ensure the implementation of high-quality multimodal facilities. As the

Project develops, US2 will work to integrate new pedestrian and bicycle networks on the D Blocks into ongoing neighborhood improvements and will coordinate with the City as required. District zoning will govern building setbacks and prioritize the public way for pedestrians along 'Pedestrian Streets' (Somerville Avenue, Prospect Street, Washington Street, Bow Street and Webster Avenue). Similarly, with the provision of an estimated 1,750 bicycle parking spaces, ease of access, and utility of bicycle infrastructure will be central to advancing the City's and Proponent's mode share goals. Please refer to Figure 1-17 in the FEIR for a depiction of the bicycle infrastructure planned for the area, and Figure 1-12 in the FEIR depicts the open space, public realm and pedestrian connection network.

Additionally, over time, the City will be implementing a 'Complete Streets' approach as streetscape improvements are completed on many of the other streets in the neighborhood as outlined in Section 1.4 of the FEIR.

walkBoston™

August 21, 2018

Matthew Beaton, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office, Analyst Alex Strysky
100 Cambridge Street, Suite 900
Boston, MA 02114

Re: Union Square Redevelopment 15889

Dear Secretary Beaton,

WalkBoston appreciates the opportunity to comment on the proposal for Phase I of the Union Square Redevelopment in Somerville. We offer our comments on the pedestrian issues associated with this project.

Our comments focus on the general approach, open space in the initial development and the pedestrian connections between the new station and the older portions of Union Square.

The project in general

WalkBoston is excited about the generous inclusion of elements in this project that will enhance and encourage pedestrian movement throughout the area. In addition, the process leading to this proposal seems to have been handled well by the city, its residents and the proponent. We enthusiastically support the request for a Phase I waiver.

This proposal is exciting, as it marks the beginning of a larger project that will transform Union Square. The 3.5 acre site with the proposed initial buildings will be the beginning of a concentration of development around the upcoming Union Square Green Line station which it directly abuts. The buildings are intended to be the first link between the new transit station and the existing intensive uses in what is traditionally known as Union Square, which begins at the intersection of Somerville Avenue and Prospect Street and extends toward Bow Street.

Open Space

Although the initial pedestrian connections are located on only one side of Prospect Street, they will bring about extensive change to this appearance of this old industrial street. The open space lining the east side of Prospect Street is an elongated triangle, the base of which is a wide entrance to the new transit station. The triangle extends north, narrowing to become a traditional sidewalk as it nears Somerville Avenue. The promise of this space lies in the proponent's encouraging intentions to add extensive plantings and large trees in 15,000 square feet of open, publicly accessible civic space with 500 linear feet of seating options. The design of the space could result in pedestrians being enveloped in the space and not noticing that the other side of the street is not quite as handsome – an effective way to energize the space until development occurs around it.

The space is to be available to be programmed for a variety of activities. Transit connections from the Green Line Extension as well as a dedicated bus lane on Prospect Street will lead to substantial pedestrian density and transit interactions to support the beginning of prosperity for this new development district.

Pedestrian connections

The proposal calls for two tall buildings at each end of the site: a 25-story building marking the portion of the site closest to the transit station and a 10-story building marking the end of the site at Somerville Avenue. A six-story link between the two taller buildings will include a parking garage plus residences. A total of 450 residences will be included.

The northernmost building at the corner of Somerville Avenue and Prospect Street will be primarily commercial office or lab units located above first-floor retail spaces. Retail spaces continue along Prospect Street, lining the pedestrian way between the transit station and Somerville Avenue. A unique feature is the intention of the proponent to provide 13,000 square feet of space for Arts and Creative Enterprise (ACE) space, defined as live/work units, fabrication or maker space, co-working or other arts programming. The proponent's intention is based on encouraging a creative economy to thrive in the midst of an embryonic urban employment center. ACE space can be especially attractive to pedestrians, and enliven the ground-floor uses of the proposed new buildings.

Of particular interest to pedestrian advocates, and not fully explained in the documentation on Phase I of the project, is the intention of the developer for the space that separates the 10-story building at the north end of the site and the remainder of the structures to the south. This looks WB.1 on the plan like a street, but is quite narrow. No intersection for vehicular traffic is indicated by the plan to allow a physical roadway between this street and Prospect Street; such a connection would cross the wide pedestrian spaces lining Prospect Street and would seem to be potentially annoying and disruptive to pedestrian flows along Prospect Street. This street contrasts with others intended to serve vehicles, which are clearly aligned to the rear of the proposed buildings and do not interfere with the proposed pedestrian way along Prospect Street. The proponent should clarify the purpose and potential uses of this thoroughfare.

Thank you for your consideration of our comments.

Sincerely,

Wendy Landman

Wendy Landman
Executive Director

WB.1 **Clarify uses of the thoroughfare between the building at the north end of the site and the remainder of the structures to the south.**

The thoroughfare on D2 is one of three permitted through-block connections within the Project area. In general, the thoroughfares are intended to serve two main purposes: (1) breakdown the scale of the larger blocks to improve overall neighborhood circulation and (2) reduce the number of service and access curb cuts on the pedestrian streets to favor pedestrian mobility.

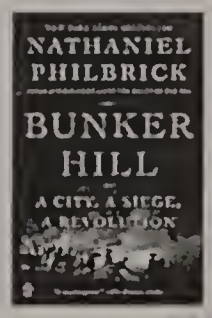
While this particular thoroughfare, currently known as Bennett Court, provides a point of vehicle access to the rear alley to service the buildings and parking, it will also provide pedestrian access to entrances to the commercial building to the north and the residential building to the south. Direct access to the rear alley is also provided off Somerville Avenue which limits the volume of vehicles that would be required to traverse the Somerville Avenue and Prospect Street intersection should only one access point exist. The physical appearance of this thoroughfare is planned to be more consistent with other pedestrian ways in order to demonstrate its prioritization of pedestrian use above its secondary objective of providing vehicular access. Continued public process has continued to evolve the site plan resulting in changes that enhance the public right-of-way while increasing it in size. The current site plan is provided as Figure 1-8 in the FEIR.

RECEIVED
AUG 09 2018
MEPA

Somerville Catholic Collaborative
Patronage of St. Joseph (1869)
St. Catherine of Genoa Church & School
St. Ann's Parish

August 2, 2018

RE: EEA No. 15889 **Union Square Redevelopment, Somerville MEPA Review**
http://unionsquareneighborhoodcouncil.org/2-uncategorised/142-15889-mepa-consultation-session
https://en.wikipedia.org/wiki/Union_Square_station_(MBTA_Green_Line_%22E%22_Branch)



Mr. Alex Strysky - Agent
Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114
phone: 617-626-1025
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Executive Office of Energy and

Email: env.internet@state.ma.us

Dear MEPA Secretary Matthew A. Beaton:

Next year the Patronage of St. Joseph will celebrate 150 yrs as a parish. The Somerville Times recently reported on Rt. 28 "Monsignor McGrath Highway"--the longest state numbered road in Massachusetts which is named after the former pastor at St. Joseph's who served for over 65 yrs in Union Square. [http://www.thesomervilletimes.com/archives/85393] The present church dates back to 1874 and the other structures on the corner of Washington St. and Webster Ave. represent a significant segment of the Union Square area. My brother's parish (Fr. Joseph is administrator), Sacred Heart in East Cambridge celebrated 175 yrs last year and was assembled when the present area of Cambridge and Somerville was grassland and largely unsettled. As a result, the Catholic community in this area has witnessed and been part of much of the recent history of this area. [https://archive.org/details/storyofsomervill00haley]

The citizens are glad to see improvements and the promise of renewal taking place in what has been a somewhat blighted region. We're anxious to accept new employment opportunities and excited about proposed new neighbors expanded our already diversified community. At the same time we are vigilant and concerned about this process taking place in an orderly and well thought-out manner. [https://discoverusq.com/]

It was just four years ago this week that a rare tornado hit the Revere Beach area nearby and resulted in $180,000 flooding damage to our lower church area at St. Joseph's. This is just one of several flooding incidents which have inundated Union Square over the years. Steps have been taken to address drainage concerns and agreements have been made, I understand, to expand MWRA connections separating sewrage which is sent to the Nut Island Headworks from rainwater runoff but one wonders if this arrangement is sufficient to address new construction demands with more impermeable acreage and drainage allowances. [http://www.mwra.state.ma.us/03sewer/html/sewnitp.htm] SSC.1

Union Square has received state funding through MassWorks grants [https://www.bizjournals.com/boston/news/2016/11/10/state-awards-grant-to-somerville-kicking-off-1b.html] but one wonders if this is sufficient to meet future needs in light of the massive redevelopment plans as proposed.
Nunziato Field and Dog Park is the location of an important stormwater infrastructure project aimed at ameliorating flooding in the Union Square neighborhood in times of intense rain events. [https://www.somervillema.gov/nunziato]
Scout Magazine in Somerville has referred to 'Storage Wars' when decribing the proposed Nunziato playground underwater tanks. [http://scoutsomerville.com/nunziato-field-stormwater-management/]
Lincoln Park near St. Joseph's also has a storage water arrangement as part of its planning.
[https://www.mackaycompanies.com/lincoln-park---somerville.html]

If I may quote from recent writeups on Union Square's history....[c.f.: unionSQsomervillemuseum52518.docx attachment]
By the middle of 19th century, Somerville was an industrial center, attracting immigrants in search of work in the Boston

area. The city's proximity to the capital allowed it to function as a "vestibule" to Boston, said architectural historian Edward Gordon, who currently works at the Old Schwamb Mill Museum in Arlington.
In the 1830's, the Boston and Lowell Railroad ran through East Somerville, and freight and passenger lines on the Fitchburg Railroad paralleled Somerville Ave. The railroads attracted additional industries seeking easy access to shipping and transportation. The Middlesex Canal also ran through East Somerville and fell into Charles River Bay, where Sullivan Square is today.
When Somerville separated from Charlestown in 1842, the immigrant population was largely Irish, but in following years, the city saw an increase in Canadian migration.
Many immigrants worked at the Middlesex Bleachery and Dye Works, located at the intersection of Central St. and Somerville Ave., where Conway Park is today, according to Gordon. Others worked at American Tube Works, which is now a working space for local entrepreneurs, and in brick-making, meat-packing and glass-making.

Consequently, brownfield remediation [https://www.epa.gov/brownfields] is an ongoing concern particularly on the 'D2' lot at the intersection of Washington St., Somerville Ave. and Prospect St. where the Union Square MBTA station will be built. [https://ofmpub.epa.gov/apex/cimc/f?p=CIMC:73:::NO:73:P71_WELSEARCH:02143%7CZipcode%7C%7C%7C%7Ctrue%7Ctrue%7Ctrue%7Ctrue%7Ctrue%7Ctrue%7C%7C-1%7Csites%7CN%7Cbasic]

Justifiably, Somerville has been awarded clean-up grants in the past
[https://nepis.epa.gov/Exe/ZyNET.exe/P100KX42.TXT?] but, as witnessed by the discussions at our 8/2/18 MEPA SCC.2
gathering in the Somerville Public Safety building, there are many serious environmental concerns remaining particularly as they relate to the former Kiley Barrel site. [https://nepis.epa.gov/Exe/ZyNET.exe?]
[https://www.mass.gov/files/documents/2016/08/rv/bst1112.pdf] http://mass.gov/dep/
Presently, the US2 design for the 'D2' plot which was shown at the public safety building open house a couple of months
ago indicates a three story garage with a service road parallel to Allen St. which will cause excessive noise and disruption of SCC.3
the homes in the Allen St. area. Since there seems to be a 22 to 30 ft. clay strata beneath the 'D2' plot and since a good part of the 'D2' soil seems to be contaminated, might it not be a solution to remove this 30 Ft. top layer and put the garage parking below ground similar to what is planned for the King Open School Project nearby on Cambridge St. Cambridge?

Beneath the ground in this area we have Millers River which was used for many years as a dumping ground for industrial waste and still is a factor of concern today.
[https://ipfs.io/ipfs/QmXoypizjW3WknFiJnKLwHCnL72vedxjQkDDP1mXWo6uco/wiki/Millers_River_(Middlesex).html https://en.wikipedia.org/wiki/Millers_River_(Middlesex)]

At the moment, Union Square is at a standstill in the midst of gridlock. Already narrow and dangerous streets are further confined by ongoing infrastructure repairs and upgrading. A new $150,000 traffic signal network needs to be 'tweeked' to assure the smooth flow of vehicles. Two way traffic has been re-introduced to Prospect St. and Webster Ave. along with added bike lanes and on street parking as well as bus drop off stations thus complicating the driver's existence. The city has always been a 'drive-through' option for neighboring Cambridge and abutting towns. I'm told that 80% of existing traffic merely 'passes through' without providing any economic benefit to Somerville. Also, I understand that all of the seven interesections near Union Square have an 'F' rating in terms of efficiency and safety. Cars/trucks/buses which are 'idling' in stalled traffic will spew out even more pollutants than those which are 'breezing through' a roadway or intersection.

Mr. Randy Creel, a parishoner, is a division manager for the Ford Motor Co. in Michigan with a desk not far from Henry Ford III, the son of Edsel. Of course, the first Ford factory outside of Dearborn, MI was on the Charles River at the B.U. bridge before it moved to an Edsel assembly plant in Somerville (hence, the Assembly Row development). Mr. Philip Parsons, a former Dean of Planning at Harvard Univ. was working for Audi to designate Somerville as a model city looking to the future of the car industry. Both Ford and Audi are interested in our city because it remains one of the most densely populated areas (#15 ?) in the nation. However, after the 'Big Dig' tunnel poured traffic onto Rt. #93 and surrounding roadways, the courts mandated the present extension of the MBTA GLX line – the 'E' branch to Somerville and Medford.

Moreover, the new Encore (formerly Wynne) Casino scheduled for completion in June, 2019 (a $2.5 billion project) is only two miles from Union Square and will undoubtedly pour even more trucks, cars and buses onto our jammed roads. New developments nearby in Cambridge such as the King Open School on Cambridge St. and massandmain.com in central square the six building MIT Innovation Center on Main St. are sure to increase the volume of traffic in the area. In addition, the Assembly Row expansion—Xsembly--will only increase traffic on the Monsignor McGrath (Rt. #38) Highway. This $2.5 billion development continues to transform a significant region of the 4 sq. mile city footprint.
[https://www.bizjournals.com/boston/news/2018/08/01/boeing-mit-to-open-autonomous-flight-research.html]

[https://patch.com/massachusetts/somerville/somervilles-assembly-row-whats-coming-2018]
[https://boston.curbed.com/2017/2/15/14614666/somerville-assembly-row-expansion-apartments-condos-hotel-office-building]

According to a Globe report, "At least 13 people have been killed while bicycling on city streets in the last five years." [http://www.wbur.org/cognoscenti/2015/09/04/bike-safety-in-boston-simon-waxman] In 2009 alone, the last year for which the Centers for Disease Control and Prevention collected metro-region data, there were 244 automobile fatalities in the Boston area. Nationwide, there were 623 cyclist deaths in 2013, compared to nearly 34,000 automobile drivers and passengers, again according to the CDC. New segregated bike paths and corridors such as Western Ave. near Central Square in Cambridge and other safety measures have been increased in recent months. Nonetheless, Cambridge and Somerville have some of the most dangerous bike pathways in the State. [gis.massdot.state.ma.us/maptemplate/topcrashlocations] Beacon St. to Inman Square in Cambridge, for example, is listed as one of these most dangerous biking regions as well as Prospect St. in Cambridge and Bow St. in Union Square. [https://bostoncyclistsunion.org/advocacy-campaigns/bikeways-for-everybody]

If we're relying on the new Union Square MBTA station to handle 6,000 riders each day, there are some serious accessibility issues which must be faced. The JFK/UMASS MBTA Station in Dorchester (Kosciuszko Circle) which has a similar drop off arrangement on a bridge similar to Somerville has an Elevator and Escalator (up only). Handicapped accessibility is therefore an issue. At the moment there are only planned ramps which will run along beside Prospect St. in a scrap of noisy, polluted left over land with a view under the Prospect St. roadway which is hardly inviting or healthy for pedestrian safety. Instead of encouranging foot traffic through a central courtyard within the building complex; this area has been designated as an exclusive 'resident only' amenity and residents must 'walk around' the site when entering or exiting the Green Line trolleys according to most recent plans. The Kosciuszko Circle roadway near the UMASS/JFK station has been called, "A Way Out of the City's Roadway from Hell..." (Boston Globe - July 25, 2015) - Is this a warning to Union Square? [https://www.bostonglobe.com/metro/2015/07/25/fix-traffic-circle-can-come-too-soon-dorchester/Vhd7pm3gq4dClPpmtU5WoK/story.html] SCC.4

Big Dig/Pollution—Emissions/Tufts Study – Court orders extension of Green Line
A growing body of scientific evidence suggests that that chronic exposure to motor vehicle pollution can trigger health problems such as asthma and cardiovascular disease. These associations constitute a major public health concern and also present issues of environmental justice, since many of the population living near major roadways are from low-income or minority groups. [https://valleyadvocate.com/2010/04/29/motor-vehicle-pollution-social-justice-and-public-health/] Few, if any, other large American urban areas have a major interstate buried in a tunnel that runs directly beneath the heart of the city. Before the Big Dig sank Boston's Interstate 93 beneath the city, the pollution from car exhaust was distributed widely along the length of the highway. Now, it is concentrated in and around the tunnel system. Before Tufts Professor John Durant, proposed this project, no one had focused on analyzing air dispersal patterns from the northbound and southbound Central Artery Tunnel exits. Results ranked Somerville as the **city with the highest rate of lung cancer and heart attack deaths in the region, with 35 excess deaths — those over the number that are statistically expected per square mile, compared with just 3 in Milford.** Research has demonstrated pollution's negative health effects on the cardiovascular system, the respiratory system, and on cognitive function.
[https://engineering.tufts.edu/news/2017/04/modeling-air-pollution-boston
https://www.bostonglobe.com/metro/2016/04/13/new-evidence-dangers-living-near-highways/hVvqTnY4ivn9YRoNSwWtGI/story.html

Green & Open Space – SomerVision – Neighborhood Plan – Comprehensive Design – LOCUS – Smart Cities
SomerVision is the city's comprehensive neighborhood plan. [https://www.somervillema.gov/somervision] Beginning in 2009, Somerville residents and City planning staff engaged in a lively community planning process with the goal of creating "SomerVision: Somerville's Comprehensive Plan 2010-2030." After more than fifty meetings, visioning sessions, and public workshops the final SomerVision plan was endorsed by the Board of Aldermen and adopted by the Somerville Planning Board in April of 2012. SomerVision is aimed at long-range, city-wide planning objectives based on community-generated values and vision. Somerville is always changing and the SomerVision plan helps ensure that our city continues to be an exceptional place to live, work, play, and raise a family. Appendix 2: p. 141-143 refers to 125 acres with 25 acres in the Union Square neighborhood out of the 2,640 acres in the city's four square mile coverage - areas to conserve, enhance, and transform. 5 Acres in Union Square seem to be designated for open space—however, the US2 plan doesn't seem to meet these comprehensive goals. The open space (on top of the three story garage in the middle of the lab, retail and 25 story apartment complex is apparently designated as an amenity for owners/renters which is not open to the public. Is the US2 plan compatible with the Neighborhood Plan and other city wide comprehensive projections? SCC.5

Today the tallest building in Union Square is Fr. Properzi Towers on Warren Ave. which is named after the priest who

founded St. Anthony's on Properzi Way off Somerville Ave. (75 yrs Italian and 25 yrs Brazilian) by the Scalibrini Fathers.
Properzi Manor, Somerville | 230498 | EMPORIS
Properzi Manor is a 11-story low-rise building in **Somerville,** Massachusetts, U.S.A.. View a detailed profile of the structure 230498 including further data and descriptions in the Emporis database.

https://www.emporis.com/buildings/230498/properzi-m

On the other hand, it was just a year ago that a cladding issue covering Grenfell Towers in London resulted in tragedy.
[https://www.thesun.co.uk/news/3804113/cladding-grenfell-tower-fire-london-latest/]
The **Grenfell Tower fire** broke out on 14 June 2017 in the 24-storey Grenfell Tower block of flats in North Kensington, West London, United Kingdom. It caused 72 deaths, including two who later died in hospital.[1][2] Over 70 others were injured and 223 people escaped.[3][4][5][6][7][5][8] It is the deadliest structural fire in the United Kingdom since the 1988 Piper Alpha disaster and the worst UK residential fire since the Second World War.
[https://en.wikipedia.org/wiki/Grenfell_Tower_fire
https://www.thesun.co.uk/news/3805218/grenfell-tower-fire-cause-cladding-doors-start/]
We must be sure that any high rise buildings especially (and one or two 25 story apartment units are already proposed on Prospect St. and Webster Ave.) have adequate exit/fire escape routes as well as fire retardant materials used in construction. SCC.6

In addition, much of the Boston coastal area is made up of island and filled-in wetlands/marshlands. This could mean that the region is unstable especially for high rise buildings. Sixty Minutes (Channel #4 ABC) recently (Sun—8/5/18) covered the story of Millennium Towers in San Francisco which has been discovered to be leaning due to a problem with the bedrock foundation. This 58 story skyscraper has sunk 17 inches and tilted 14 inches since it was completed in 2008. SCC.7
Boston has also been debating for several months the 'shadow' issue
Serious consideration should also be given to the Barr Report on Rising Tides Sea level in the Boston harbor coastline. SSC.8

PREPARING FOR THE RISING TIDE SERIES
VOLUME 2 | AUGUST 2014
https://www.massport.com/media/266263/Report_Designing-with-Water_BHA-and-Sasaki.pdf

PREPARING FOR THE RISING TIDE SERIES
VOLUME 2 | AUGUST 2014
DESIGNING WITH WATER
CREATIVE SOLUTIONS FROM
AROUND THE GLOBE
Preparing for the Rising Tide (2013) provided an initial assessment of Boston's vulnerability to coastal flooding due to storm surges and sea level rise.

Nearby projects in East Cambridge (my brother's territory) such as the King Open School Design scheduled for completion in 2020 promise rainwater harvesting, geothermal heating, photo-voltaic panels, solar-thermal, photo-voltaic shade system, drought tolerant plantings, and subterranean parking.
https://www.bdcnetwork.com/sites/default_files/Screen%20Shot%202017-10-28%20at%2012.07.43%20PM_0.png
https://www.bdcnetwork.com/new-elementary-school-cambridge-mass-aims-being-pilot-city%E2%80%99s-nze-commitment
https://www.cambridgema.gov/departments/citymanagersoffice/kingopenandcommunitycomplexproject
http://www.arrowstreet.com/2016/09/king-open-and-cambridge-street-upper-schools-community-complex-groundbreaking/
https://www.bizjournals.com/boston/news/2018/08/01/boeing-mit-to-open-autonomous-flight-research.html
http://massandmain.com/
A couple of days ago I noticed in the Wall Street Journal mention of the exterior walls of 570 Broome St. -- a 54-unit condo project under construction in Manhattan--which will be made of a durable stone product called 'sintered stone', which is treated with a specialized liquid form of titantium dioxide that breaks down air contaminants. The facade is coated with a spray-on solution called Pureti. The treatment, which is water-based, provides 570 Broome with the purifying power of 500 trees—which is basically like taking 2,000 cars off the road for a year. All part of the environmental considerations--green roofs, LEEDS gold rating for smart building

https://www.mbta.com/news/2013-12-06/somerville-po..

Somerville poised to grow along Green Line

Posted on December 6, 2013

By Steven A. Rosenberg, Boston Globe

Mayor Joseph A. Curtatone stood on a bridge in Union Square that can be seen from Prospect Hill, where George Washington ordered his troops to raise the Grand Union flag on New Year's Day in 1776....From the bridge, where the new Union Square station is expected to be completed in 2017, Curtatone pointed to a gritty metal scrapyard and a used plumbing and heating supply shop next to a set of commuter rail tracks. "This will change," said Curtatone, looking over the 3.8-acre site, where up to 600,000 square feet of new development is expected — including buildings as high as 10 stories — with the subway stop as its hub. "It's the transformation that we all dreamed about."

In economic terms, Somerville has been able to quantify the benefits. By 2030, the cityprojects that 17,300 new jobs and 3,600 residential units will be created around Union Square and at the Washington Street station nearby, which is also expected to open in 2017.

The new jobs are expected to help keep more people in the city. These days. just 15 percent of the workforce works in Somerville or lives within walking distance of Davis Square or Sullivan Square, according to the city. By 2019 — when the Gilman Square, Lowell Street, and Ball Square stations are expected to begin operating in Somerville — 85 percent of the city will live within walking distance of an MBTA station.

Investors will have a chance to redevelop 192 acres throughout the city....By giving people the option to take the light rail to work, it will cut down on car pollution — which has taken its toll on Somerville residents, especially those who live near I-93 and routes 28, 38, and 99, said Wig Zamore, a Somerville real estate project developer who has volunteered to help coordinate studies with Tufts University on the health impact of cars and diesel trains on the city's roughly 77,000 residents.

According to Zamore, for those who live near Somerville's highways, heart disease mortality is highest. On I-93 alone, 150,000 vehicles pass by the city each day, and up to 60,000 cars and trucks travel along Route 28 in Somerville. In addition, up to 200 commuter-rail diesel trains rumble through the city each day.

The impact of the air pollutants from the vehicles has been deadly, according to a study prepared by Zamore. Results ranked Somerville as the **city with the highest rate of lung cancer and heart attack deaths in the region, with 35 excess deaths — those over the number that are statistically expected per square mile, compared with just 3 in Milford.**

With the Green Line extension is expected to add 45,000 daily riders by 2030 and eliminate 25,728 daily vehicle miles from the roads, the project will reduce congestion and pollution emissions, according to Ellin Reisner, director of the Somerville Transportation Equity Partnership . Zamore, who also volunteers for the partnership, is also working with **Tufts University on a new study to help improve air quality next to Somerville's busiest roads, such as I-93.**

You don't need to see the memorial tombstone at 197 Washington St. recalling the death of James Miller (65) on April 19, 1775 who was fleeing the British after the Battle of Bunker Hill in what was another part of Charlestown (last year Somerville celebrated separating 175 yrs ago from Charlestown). He was, as it says, "too old to run". Or you don't need to look up Prospect Hill in David McCullough's book "1776) or Nathaniel Philbrick's "Bunker Hill: A City, A Seige, A Revolution" to know that there's a lot of history surrounding Union Square. Opposite St. Joseph's Church on the corner of Washington, Webster and Somerville Ave. you will also find another tombstone monument marking the site of the Civil War recruiting stand in 1863 for the Union Army a century later! More recently, the Somerville Museum on Central St. has had an exhibit on the industries of Union Square where Corning Glass got its start along with Marshmellow Fluff and others.

[http://www.thesomervilletimes.com/archives/78384

Unlike other Boston development zones, Union Square is not an abandoned railroad yard (Cambridge Crossing/ Northpoint), or a former docklands and parking lots (Seaport District) but, rather, one of the most densely populated regions of the country with a long history of major historic events. It's a challenge for any developer to try and resurrect the glory of its history—a hidden gem with great potential—a site that only two miles from Boston City Hall and about a mile from the "Innovation Hub of the East Coast" (Kendall Square MIT). However, given it's roots in our nation's military – USAA, the major investor behind the recent $1.5 billion first phase – should be glad to accept this challenge to unearth one of the nations treasures.

Unfortunately, the present design for the D2 plot and MBTA station presents the back end of a three story parking garage to those entering and exiting the station. Pedestrians are forced apparently to 'walk around' the 25-story apartment tower, research labs and private ammenity rooftop green space rather than highlighting the history and industrial achievements of the area riders are 'pushed off' to the margins along ascending ramps of grass and walkway parallel to Prospect St. and viewing the underbelly of the bridge (unless creative landscaping shields the view) beside carbon emitting vehicles caught in a logjam of traffic while citizens are asked to relax with their refreshments while witnessing a certain degree of chaos.

Green and open space enhances and enriches the value of a complex and is refreshing and invigorating for the residents and visitors. Energy efficient and sustainable buildings are farsighted investments. As one of the longest inhabitants of this neighborhood/parish, might I suggest that the developer US2 would be advised to

continue their diligent efforts in helping our city to overcome the blight and decay of the past and accept the challenge of moving forward but not in haste to develop the best possible plan that meets our needs today and tomorrow. Please consider the issues outlined about and listed below before granting a waiver for the environmental and other civic concerns of the city. Thanks for your consideration.

Areas of Concern: **http://www.thesomervilletimes.com/archives/85139**

Historicity of Prospect Hill (1st Grand Union Flag/Washington & Continental Army) Recruiting for Union Army
- Industries of Union Square – Corning Glass, Beacon Roofing, Nissenbaum, Marshmellow Fluff

Waste Water Management/Rainwater Runoff Separation – Nut/Deer Island Facilities
Infrastructure – water/sewrage, high speed internet
Millers River – Mystic River & Charles River Watershed
Marshlands/Rising Tides—Sea level Issues
Brownfields
SomerVision – 125 acres green space - city approved comprehensive plans
Green & Open Space – congruent with SomerVision and Neighborhood Plan – comprehensive city vision
Design Issues – garage – Allen St. Traffic
Bike and Pedestrian Safety
Runoff Water Problems
Traffic – intersections rated "F" – particulate pollution - Tufts Univ. study [Ford & Audi Model City Plans]
- Encore (Wynne) Casino traffic
- Assembly Row Expansion – X-sembly

Millennium Towers (58 story skyscraper in San Francisco) tilting/sinking – bedrock issues --- also SHADOW Issues
- Winthrop Towers/Shadow Law/Boston Commons

MBTA Head Station Terminal – rest area and facilities for workers (provided by US2) at Union Square Somerville
- Handicapped Accessibility – Drop Off area – does it serve special needs, elderly, challenged clients?

Environmental Protection Plans at Construction Sites

Sincerely,

Fr. Richard G. Curran, Ed.D.
Somerville Civic Advisory Committee Member

Patronage of St. Joseph

264 Washington Street - Union Square
Somerville, MA. 02143-3313

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ATTACH:
UnionSquareSomervilleMuseum52518.docx
PollutionSmogLondon1952.docx
https://nextcity.org/features/view/the-city-where-real-estate-developers-and-housing-activists-agree-to-agree

https://www.bostonglobe.com/metro/2014/07/28/severe-thunderstorm-warning-issued-boston-area/niu44DD0yg1PiTCbOsVyXL/story.html

https://boston.cbslocal.com/2014/07/28/national-weather-service-investigating-possible-tornado-in-revere/

Revere hit by tornado - The Boston Globe

https://www.bostonglobe.com/metro/2014/07/28/sever... Proxy Highlight

Jul 28, 2014 ... REVERE — A rare tornado roared through this seaside city with terrifying force Monday, uprooting hundreds of trees, ripping roofs off houses, ...

EPA Mapping Brownfield Sites on 'D2' – US2 Development Site in Union Square Somerville, MA.:
https://map22.epa.gov/arcgis/rest/directories/arcgisoutput/Utilities/PrintingTools_GPServer/_ags_4e8fc84547294adab2b74e41c35460a1.pdf

https://2xbcbm3dmbsg12akbzq9ef2k-wpengine.netdna-ssl.com/wp-content/uploads/2015/10/SomerVision-Comprehensive-Plan-with-Appendices-Adopted-April-19-2012.pdf **SomerVision 2012**

SomerVision | City of Somerville
https://www.somervillema.gov/somervision Proxy Highlight
"SomerVision captures our best thinking on diversity, community, economy, accessibility, sustainability, and innovation and wraps it into one set of goals, policies ...

- **SomerVision - Somerville by Design**
https://www.somervillebydesign.com/planning/somervision/ Proxy Highlight
Beginning in 2009, Somerville residents and City planning staff engaged in a lively community planning process with the goal of creating "SomerVision: ...

- **SomervillebyDesign – Somerville || Neighborhood || Planning ...**
https://www.somervillebydesign.com/ Proxy Highlight
We pursue these goals by administering and implementing the SomerVision comprehensive plan, which addresses the City's goals, policies, and actions for the ...

- **SomerVision Comprehensive Plan, Adopted April 19, 2012.indd**
https://2xbcbm3dmbsg12akbzq9ef2k-wpengine.netdna-s... Proxy Highlight
Apr 19, 2012 ... SomerVision. City of Somerville, Massachusetts. Comprehensive Plan | 2010- 2030. Endorsed by the. Somerville Board of Aldermen. April 12th ...

- **SomerVision Sees 6,000 New Homes, Lots of Green Line Riders ...**
https://boston.curbed.com/2012/5/30/10367004/there... Proxy Highlight
May 30, 2012 ... There are many juicy morsels in Somerville's SomerVision (first of all, love the name). The final version of the 20-year master plan, three years ...

- SomerVision and Neighborhood Planning – Somerville Zoning
https://www.somervillezoning.com/zoningandsomervision/ Proxy Highlight
SomerVision and Neighborhood Planning. Click to enlarge: Maintained by the City of Somerville's Planning Department. Email us your feedback at:.

1. Brownfields Grant Fact Sheet: Somerville, MA | ...
cfpub.epa.gov/bf_factsheets/gfs/index.cfm?xpg_id=7404&...Cached
Brownfields; Fact Sheet Search; Somerville, MA; ... be used to conduct Phase I and Phase II environmental site assessments in the East Somerville and Union Square areas.
2. brownfields success in new england - EPA
www.epa.gov/region1/brownfields/success/07/Somerville_MA...
heart of the Union . Square, which is . the City's most . ... 30 Allen Street, Somerville, MA | Brownfield Success in New England Author: US EPA New England Subject:
3. EPA Awards Over $1 Million in Brownfields Grants...
   - yosemite.epa.gov
   - › Newsroom
   - › News Releases By Date

EPA Awards Over $1 Million in Brownfields Grants to Somerville ... to the city of Somerville, Massachusetts. ... Kiley Barrel site in the Union Square ...
4. Brownfields 2011 Cleanup Grant Fact Sheet ...
nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100EJ1N.txtCached
^ Brownfields 2011 Cleanup Grant Fact Sheet ^ Somerville, MA EPA Brownfields Program EPA's Brownfields ... Cleanup efforts will focus on the Union Square ...
5. Brownfields 2010 Assessment Grant Fact Sheet ...
nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100KX42.txtCached
Brownfields 2010 Assessment Grant Fact Sheet ^ Somerville, MA EPA Brownfields Program EPA's Brownfields ... in the East Somerville and Union Square ...
6. Analysis of Brownfield Cleanup Alternatives...
www.somervillema.gov/calendar/analysis-brownfield...Cached
... Somerville, MA. ... The Site is located in Union Square and consists of eight ... Comments about the proposed project and Analysis of Brownfields Cleanup ...
7. MASSACHUSETTS BROWNFIELDS SUPPORT TEAM (BST ... -...
www.mass.gov/eea/docs/dep/cleanup/bst1112.pdf
MA BROWNFIELDS SUPPORT TEAM ... revitalize the historic Union Square neighborhood ... Somerville BST has been assisting the City to
8. Brownfield Renewal
www.brownfieldrenewal.com/poy-winners2012.htmlCached
Brownfield Renewal Person of the Year 2015 | 2014 | 2013 | 2012 | | | ... City of Somerville, MA. ...
9. Union Square Development Update | Somerville, MA...
patch.com/massachusetts/somerville/union-square...Cached
Somerville, MA, Feb. 24, 2015 ... since early January residents have been trudging to meetings about the future of Union Square in the old Post ... brownfields and ...
10. Union Square Revitalization Study Neighborhood...
www.somervillema.gov/sites/default/files/documents/union...
Union Square, Somerville, MA Neighborhood Revitalization Strategy Area Plan April 02 Union Square ... Brownfields Economic Development Program ...

Brownfields Grant Fact Sheet: Somerville, MA | Brownfields and ...
https://cfpub.epa.gov/bf_factsheets/gfs/index... Proxy Highlight
EPA has selected the City of Somerville for a brownfields assessment grant. ... II environmental site assessments in the East Somerville and Union Square areas.

- EPA Grant Boosts Available Funding for Brownfield Assessment and ...
https://www.somervillema.gov/news/epa-grant-boosts... Proxy Highlight
Oct 19, 2015 ... EPA Grant Boosts Available Funding for Brownfield Assessment and Cleanup ... " From Maxwell's Green on Lowell Street to the former Kiley Barrel Site in Union Square, this ... 2528 or by email at

amaher@somervillema.gov.

- Major Investor Signs On To Union Square Redevelopment - Patch
https://patch.com/massachusetts/somerville/major-i... Proxy Highlight
Jun 5, 2018 ... SOMERVILLE, MA – The redevelopment of Somerville's Union Square has a major investor backing it. Financial services company USAA is ...

- Massachusetts' Brownfield Support Team Initiative: program design ...
https://dspace.mit.edu/handle/1721.1/81626 Proxy Highlight
Massachusetts' Brownfield Support Team Initiative : program design and implementation ... in Chicopee and the Kiley Barrel site in Somerville's Union Square.

- somerville union square briefing book - Smart Growth America
https://smartgrowthamerica.org/app/legacy/document... Proxy Highlight
Union Square Neighborhood Plan – Somerville By Design . ..... Eastern Somerville (1) City of Somerville Massachusetts. U.S.. Population ..... the City is actively involved in cleaning a brownfield site at Prospect Street and Somerville Avenue,.

- The City Where Real Estate Developers and Housing Activists ...
https://nextcity.org/features/view/the-city-where-... Proxy Highlight
Nov 3, 2014 ... Unassuming Somerville, MA. is denser than San Francisco, with ... Among them is a stop in hip Union Square poised to be a catalyst ... The vacant lot at

Uber, Lyft drivers are making city traffic worse, studies find
https://nypost.com/2018/02/25/uber-lyft-drivers-are-making-city-traffic-worse-studies-find/ Proxy Highlight
Feb 25, 2018 ... A study released in December found that large increases in the number of taxis and ride-sharing vehicles are contributing to slow traffic in ...

- Lyft, Uber increase traffic 180% in major cities - Curbed SF
https://sf.curbed.com/2018/7/27/17622178/uber-lyft-cause-traffic-streets-conge... Proxy Highlight
6 days ago ... Bruce Schaller, a transit consultant who served as deputy commissioner for traffic and planning in New York City, released a new report ...

- Uber and Lyft are creating a traffic problem for big cities - CNN Money
https://money.cnn.com/2017/10/11/technology/future/ride-hailing-cities-public-transit/ Proxy Highlight
Oct 11, 2017 ... The popularity of Uber and Lyft is increasing traffic in big cities and driving people away from public transportation. New research from the UC ...

- Uber and Lyft Make New York City Traffic 'Unsustainable' - CityLab
https://www.citylab.com/transportation/2017/12/how-to-fix-new-york-citys-uns... Proxy Highlight
Dec 21, 2017 ... How to Fix New York City's 'Unsustainable' Traffic Woes ... And they increased the amount of miles traveled by for-hire vehicles around ...

- Uber and Lyft Mean More Congestion, Trips, and Miles - CityLab
https://www.citylab.com/transportation/2017/10/the-ride-hailing-effect-more-... Proxy Highlight
Oct 12, 2017 ... A comprehensive survey in major U.S. cities finds Uber and Lyft ... Climate change combatant or urban traffic snarler? ... But commuter rail is a complementary mode—there was a 3 percent increase in use among ride-hailers .

- The route had heavy traffic | Uber Rider Help
https://help.uber.com/h/56608829-2da6-48f1-89c2-4b8c6f90f6d3 Proxy Highlight
Trip time and route distance can be impacted by heavy traffic, road construction, or other external factors. We are unable to adjust fares that are higher than ...

- Uber and Lyft are creating traffic, not reducing it, says report ...
https://www.businessinsider.com/uber-lyft-creating-traffic-cities-bruce-schaller-2018-7 Proxy Highlight
Jul 27, 2018 ... Uber and Lyft are creating more traffic and congestion instead of ... like Uber and Lyft —

passengers using those services increased 37% from ...

Fix to traffic circle can't come too soon in Dorchester - The Boston ...
https://www.bostonglobe.com/metro/2015/07/25/fix-t... Proxy Highlight

Jul 25, 2015 ... It's 8:40 a.m. on Kosciuszko Circle. And that's the third collision in less than two hours. Most drivers don't know the official name of this ...

- **How the Boston area's most maddening intersections got that way ...**
https://www.bostonglobe.com/magazine/2017/08/08/ho... Proxy Highlight
Aug 8, 2017 ... ... destination is Newton Corner — a ring of roadway above the Mass. ... on my way to Kosciuszko Circle in Dorchester, the dreaded devil rotary.

- **Kosciuszko Circle on National Registry of Historic Places ...**
https://www.dotnews.com/2015/kosciuszko-circle-nat... Proxy Highlight
Jul 16, 2015 ... Kosciuszko Circle on National Registry of Historic Places ... for the roadways as well as a review by the Massachusetts Historical Commission.

- **Driving in circles - The Boston Globe - Boston.com**
archive.boston.com/news/local/articles/2006/08/03/... Proxy Highlight
Aug 3, 2006 ... ... your rotary -- the Arborway in Jamaica Plain, Route 16 in Somerville, Kosciuszko Circle in Dorchester -- and you'll find endless horror stories.

- **Monuments - Dorchester Historical Society**
www.dorchesterhistoricalsociety.org/index.php/monuments Proxy Highlight
The Tadeusz Kosciuszko monument is located at Columbia Circle. ... John W. McCormack was a Massachusetts State Representative from 1920 to 1922, ...

- **Kosciuszko Circle: A little history - Caught In Dot**
www.caughtindot.com/kosciuszko-circle-little-history/ Proxy Highlight
Nov 28, 2017 ... So Columbia Road from Kosciuszko Circle to Farragut Road, Old Colony Avenue between Pacuska Circle and its intersection with Columbia ...

- **News to you? Boston has the worst traffic in the country! - Caught In ...**
www.caughtindot.com/news-to-you-boston-has-the-wor... Proxy Highlight
Jun 12, 2018 ... Have you seen the traffic at Kosciuszko Circle? Or how about the nightmare of Neponset Circle and Dot Ave! The gridlock can start as early at ...

- **Morrissey Boulevard - Wikipedia**
https://en.wikipedia.org/wiki/Morrissey_Boulevard Proxy Highlight
To, Kosciuszko Circle. Construction. Inauguration, =1924. Morrissey Boulevard is a six-lane divided coastal road in the Dorchester neighborhood of Boston, Massachusetts.

- **Old Harbor Reservation Parkways - Wikipedia**
https://en.wikipedia.org/wiki/Old_Harbor_Reservati... Proxy Highlight
The Old Harbor Reservation Parkways are three historic roads in the Old Harbor area of Boston. They are part of the Boston parkway system designed by Frederick Law Olmsted. They include. all of William J. Day Boulevard, running from Castle Island to Kosciuszko Circle along Pleasure Bay and the ... of Columbia Road running southwest from Kosciuszko Circle into Dorchester ...

- **Columbia Road Greenway Design - Northeastern University**
www.northeastern.edu/peter.furth/wp-content/upload... Proxy Highlight Columbia Road in Dorchester is a 2.5-mile long street with 14 signalized .... endpoints (Blue Hill Ave and Kosciuszko Circle), the intersection with the I-93 ramps, ...

Modeling air pollution in Boston - Tufts University School of ...
https://engineering.tufts.edu/news/2017/04/modelin... Proxy Highlight

Oct 3, 2016 ... Senior Jenny Skerker spent the summer studying air pollution around ... From automobile emissions to zwitterions, their summer research projects ... Before the Big Dig sank Boston's Interstate 93 beneath the city, the ... "I didn't realize that it would take more than half of my summer just to process the data.

- New evidence of the dangers of living near highways - The Boston ...

https://www.bostonglobe.com/metro/2016/04/13/new-e... Proxy Highlight
Apr 14, 2016 ... A new study of Boston residents who live or spend a significant amount of time near Interstate 93 has found that their ... and exhaust vents for Big Dig tunnels, making the park one of the most polluted places in Boston. .... 'I'm never going to forget it': Steve Pearce and the game of a lifetime · Suit alleges ...

- Motor Vehicle Pollution, Social Justice and Public Health

https://valleyadvocate.com/2010/04/29/motor-vehicl... Proxy Highlight
Apr 29, 2010 ... Health effects from UFP emissions may be more serious than ... Asthma is just one potential health concern, but is one for which large datasets are readily ... Exposure and Health (CAFEH) study by the Tufts University School of ... near the I-93 corridor (http://www.tufts.edu/med/phfm/CAFEH/CAFEH.html).

- Digging Up Trouble / The Health Risks of Construction Pollution in ...

www.sandiegohealth.org/air/ucsusa/Digging-up-Trouble.pdf Proxy Highlight
Construction Equipment Emissions Compared with a New "Big Rig". 4 ... I am especially grateful to Hien Tran, Kim ... This study analyzes air pollution caused by.

- The Tufts Daily

https://tuftsdaily.com/news/2018/01/18/green-line-... Proxy Highlight
Jan 18, 2018 ... ... mitigation under the Clean Air Act for the "Big Dig" highway project, ... "Tufts University enthusiastically supports the Green Line Extension ... MassDOT will pay for an environmental impact study and design for the Route 16 extension, ... air pollution, Barber noted, and their residents are more likely to rely ...

- Health effects of transport-related air pollution - WHO/Europe - World ...

www.euro.who.int/__data/assets/pdf_file/0006/74715... Proxy Highlight
Air pollution 2.Air pollutants 3.Vehicle emissions – adverse effects. 4. Environmental exposure 5.Health policy 6.Policy making 7.Europe. I. Krzyzanowski, Michal ...

- Cutting Carbon Emissions: Better Environment, Worse Economy ...

https://mediahub.unl.edu/media/4183 Proxy Highlight
Mar 5, 2015 ... Cutting Carbon Emissions: Better Environment, Worse Economy? ... ECONOMICS AT TUFTS UNIVERSITY; [00:03:14.294]AND A RESEARCH ASSOCIATE. .... [00:10:35.368]AND A STUDY THAT I DID WITH COLLEAGUES AT M I T .... [00:15:04.603]IT IS QUITE STRIKING HOW BAD THE POLLUTION IS.

- CO2 emissions are being 'outsourced' by rich countries to rising ...

https://www.theguardian.com/environment/2014/jan/1... Proxy Highlight
Jan 19, 2014 ... Since 2000, annual carbon dioxide emissions for China and the other rising ... In addition, a large and growing share of the carbon pollution ...

- Somerville poised to grow along Green Line | News | MBTA

https://www.mbta.com/news/2013-12-06/somerville-po... Proxy Highlight
Dec 6, 2013 ... ... Square put Somerville on the Red Line in 1984, the Big Dig was its unlikely champion. ... On I-93 alone, 150,000 vehicles pass by the city each day, and up to

How Dangerous Is Riding In Massachusetts? | Boston Motorcycle ...
https://www.jeffreysglassman.com/how-dangerous-is-... Proxy Highlight

This won't completely eliminate the danger, but our Boston motorcycle accident lawyers at The Law Offices of Jeffrey S. Glassman know it can significantly ...

- **https://www.somervillema.gov/visionzero**

Vision Zero aims to eliminate traffic fatalities and serious injuries on Somerville's streets.
Launched by Mayor Joseph Curtatone in September 2017, Vision Zero Somerville reaffirms the City's commitment to multi-modal road safety

- **Cycling In Massachusetts: Dangerous Motorists Fail To Yield ...**

https://www.bikeattorney.com/cycling-in-massachuse... Proxy Highlight
Boston bicycle accident attorneys at The Law Offices of Jeffrey S. Glassman's BikeAttorney.com know well that Massachusetts law gives bicyclists the right to use ...

- **Motorcycle Accident Statistics in Massachusetts - Joel H. Schwartz, PC**

https://www.joelhschwartz.com/motorcycle-accident-... Proxy Highlight
Motorcycle Accident Statistics in Massachusetts ... Proportionally, the situation for bikers in Massachusetts is not very different from ... Traffic Danger Staying High.

- **Harvard study: Odds of Boston cyclists being injured in accidents ...**

https://www.bostonglobe.com/metro/2016/11/30/harva... Proxy Highlight
Nov 30, 2016 ... The odds of cyclists being injured in an accident in Boston have ... Boston, Massachusetts – 8/19/2015-- A bicyclist is silhouetted ... crosswalks, and rolling out the Hubway bike-share program in 2011. ... For many, Amanda Phillips' death served as another reminder of the dangers of biking in Boston.

- **If you crash... - Massachusetts Bicycle Coalition**

www.massbike.org/if_you_crash Proxy Highlight
If you are lying in a place where you are not in danger, take a few minutes to relax, ... If the motorists involved in the crash move their vehicles, note where their ...

- **Dangerous Roads in Massachusetts | Cambridge Car Accident ...**

https://www.chelaw.com/dangerous-roads-in-massachu... Proxy Highlight
However, some roads in our state are more prone to accidents than others. If you have been injured on one of Massachusetts' most dangerous roads, it is ...

- **Most Dangerous Intersections in Massachusetts [INTERACTIVE]**

https://www.sweeneymerrigan.com/most-dangerous-int... Proxy Highlight
Below are the 10 intersections with the most injury accidents according to the Massachusetts Department of Transportation. If you click and zoom around the ...

- **Top Crash Locations - MassDOT**

gis.massdot.state.ma.us/maptemplate/topcrashlocations Proxy Highlight
Please note that creating presentations is not supported in Internet Explorer versions 6, 7. We recommend upgrading to the latest Internet Explorer, Google ...

- **Boston Bike Accident Special Report : Law Offices of Mark E ...**

https://www.marksalomone.com/boston-bicycle-accide... Proxy Highlight
Jun 2, 2017 ... Our law firm analyzes the causes of bicycle accidents in Boston. ... methods for preventing bicycle accidents involving motor vehicles in Boston, Massachusetts. .... Most Dangerous Boston Streets, Intersections for Cyclists.

- **Top 200 Most Dangerous Intersections in Massachusetts Illustrate ...**

https://www.bostonpersonalinjuryattorneyblog.com/t... Proxy Highlight
Sep 25, 2011 ... Top 200 Most Dangerous Intersections in Massachusetts Illustrate Risks of ... for car, bicycle

Millennium Tower in San Francisco is still sinking, leaning ...

https://www.businessinsider.com/is-millennium-towe... Proxy Highlight
Jul 24, 2018 ... Millennium Tower is a luxury residential high-rise in San Francisco that has sunk 17 inches and tilted 14 inches. Here's what we know about its ...

- **San Francisco's leaning tower of lawsuits - CBS News**
https://www.cbsnews.com/news/millennium-tower-san-... Proxy Highlight
The Millennium Tower opened to great acclaim with high-priced, posh apartments. But those accolades and property values are sinking, along with the ...

- **Sinking high-rise: The $500 million plan to fix SF's Millennium Tower ...**
https://sf.curbed.com/2018/4/16/17242450/millenniu... Proxy Highlight
Apr 16, 2018 ... The 58-story Millennium Tower cost an estimated $350 million to build in 2008, but the cost to fix the sinking and tilting skyscraper may climb ...

- **Millennium Tower (San Francisco) - Wikipedia**
https://en.wikipedia.org/wiki/Millennium_Tower_(Sa... Proxy Highlight
The building is leaning toward the northwest. ... is suing Millennium Partners, the City of San Francisco, and the TJPA ...

- **Apr 16, 2018, 4:37 am PDT A fix for the leaning Millennium Tower is in**
https://www.bizjournals.com/sanfrancisco/news/2018... Proxy Highlight
Apr 16, 2018 ... At one time the most expensive condominium development in San Francisco, the sinking and leaning Millennium Tower may get repaired but ...

- **Repairing San Francisco's Leaning Millennium Tower Requires an ...**
https://edmdigest.com/mitigation/repairing-san-fra... Proxy Highlight
May 2, 2018 ... By David E. Hubler Contributor, EDM Digest. San Francisco's Millennium Tower may not last a century, no less a millennium if an ...

- **A brazen homeowner at San Francisco's leaning, sinking skyscraper ...**
https://www.sfgate.com/technology/businessinsider/... Proxy Highlight
Feb 23, 2018 ... The situation at Millennium Tower, a San Francisco skyscraper that is sinking and leaning, is so dire that residents have been selling their ...

- **Pricey retrofit proposed for sinking Millennium Tower in SF ...**
https://www.sfchronicle.com/bayarea/matier-ross/ar... Proxy Highlight
Apr 16, 2018 ... Engineers have proposed an unconventional solution to the Millennium Tower's tilting troubles: drilling piles down to bedrock to stabilize one ...

- **San Francisco's Millennium Tower Keeps Leaning - Newser**
www.newser.com/story/251293/with-no-fix-in-sight-s... Proxy Highlight
Nov 8, 2017 ... San Francisco's 58-story Millennium Tower has sunk 17 inches and tilted 14 inches to the northwest since building started in 2006, reports 60 ...

- **San Francisco's 'Leaning Tower' Has Residents Fuming : NPR**
https://www.npr.org/2017/01/04/508241969/san-franc... Proxy Highlight
Jan 4, 2017 ... A luxury high-rise in San Francisco is sinking. The Millennium Tower has sunk more than a foot since its completion in 2010. It's also tilting ...

Baker signs bill to allow proposed 775-foot ... - The Boston Globe
https://www.bostonglobe.com/business/2017/07/28/ba... Proxy Highlight

Jul 28, 2017 ... The Boston Common shadow fight is over. For now ... The building will cast new shadows on the parks on many early mornings. Boston Mayor ...

- **Galvin says Winthrop Square tower shadows ... - The Boston Globe**
https://www.bostonglobe.com/business/2017/07/11/ga... Proxy Highlight
Jul 11, 2017 ... A rendering of Millennium Partners' proposed building on the site of the ... F. Galvin is not backing down over shadows on Boston Common.

- **Building Boom in Boston Casts Shadows on History and Public Space**
https://www.nytimes.com/2017/07/11/us/boston-devel... Proxy Highlight

Jul 11, 2017 ... The Boston Common, near the corner of Boylston and Tremont Streets. Nearby buildings cast substantial shadows in the area until about 10:30 ...

- **A Shadow Cast Over Boston's Building Boom | Construction Law Zone**

https://www.constructionlawzone.com/2017/07/a-shad... Proxy Highlight
Jul 27, 2017 ... The first law, the Boston Common Shadow Law restricts new shadows on the Boston Common to the first after sunrise or 7:00 AM (whichever is ...

- **Boston Common: Open Season on Open Space: Landslide 2017 ...**

https://tclf.org/sites/default/files/microsites/la... Proxy Highlight
The building would cast a long shadow over the Boston Common in violation of the state's 1990 shadow law, meant to protect the park from excessive amounts ...

- **Tower Wins In Brief Beacon Hill Battle Over Shadow Law | Bostonomix**

www.wbur.org/bostonomix/2017/07/31/beacon-hill-sha... Proxy Highlight
Jul 31, 2017 ... The proposed construction has raised concerns about the shadow to be ... "This common sense change will better protect the Boston Common ...

- **Local Throwing shade: Boston Common friends knock skyscraper plan**

https://www.boston.com/news/local-news/2017/05/04/... Proxy Highlight
May 4, 2017 ... If a person is sitting on a bench and a building casts a shadow, they'll move ... The 50-acre Boston Common was founded in 1634, making it the ...

- **Shadow Law | Friends of the Public Garden**

www.friendsofthepublicgarden.org/tag/shadow-law/ Proxy Highlight
Height of Winthrop Square Tower Lowered, Shadow Impact Still Felt on Parks ... Winthrop Square Home Rule Petition Boston City Council | April 19, 2017.

- **Boston shadows legal change doesn't mean Winthrop Square tower ...**

https://boston.curbed.com/2017/7/31/16059484/bosto... Proxy Highlight
Jul 31, 2017 ... ... governing shadows that new buildings can cast in downtown Boston. ... shadows over certain areas, including the Boston Common and the ...

- **This digital 3-D model of Boston reveals the shadows cast by new ...**

https://archpaper.com/2018/05/new-digital-3-d-mode... Proxy Highlight
May 9, 2018 ... On May 8, Boston's Planning & Development Agency (BPDA) released a ... by debates surrounding shadows cast on the Boston Commons by new skyscrap

Manhattan's newest luxury building has the air-purifying power of ...
https://quartzy.qz.com/1269569/this-nyc-luxury-bui... Proxy Highlight
May 7, 2018 ... What's more, the façade of 570 Broome is crafted from sintered stone slabs of Neolith—a materials brand that specializes in clean design.

- **Checking In on 570 Broome; First U.S. Condo to Use Self-Cleaning ...**

https://www.cityrealty.com/nyc/market-insight/feat... Proxy Highlight
Jun 4, 2018 ... 570 Broome is one of several new NYC residential developments taking the green ... titanium dioxide nanoparticles on the Neolith sintered stone exterior. ... at 570 Broome Street; Hudson Square Condos Start at $1.37 Million.

- **A Condo Façade That Cleans Itself—and the Air Around It - WSJ**

https://www.wsj.com/articles/a-condo-facade-that-c... Proxy Highlight
May 29, 2018 ... 570 Broome in Manhattan incorporates an exterior treatment that fights grime ... its first residential application at 570 Broome Street in Manhattan, a 54-unit ... the company behind the sintered stone slabs used at 570 Broome.

- **570 Broome brings 'attainable' condos to former church ... - Curbed NY**

https://ny.curbed.com/2017/10/24/16535102/570-broo... Proxy Highlight

Oct 24, 2017 ... Joining Renzo Piano's 565 Broome Soho is now 570 Broome, a 25-story condo ... evidently in its Neolith sintered stone slab-clad walls and interior stonework, ... FiDi landmark One Wall Street's new condos will average $3M ...

- **A Condo Façade That Cleans Itself—and the Air Around It - Mansion ...**

https://www.mansionglobal.com/articles/a-condo-fac... Proxy Highlight

May 29, 2018 ... 570 Broome in Manhattan incorporates an exterior treatment that fights grime ... its first residential application at 570 Broome Street in Manhattan, a 54-unit

Death by smog: London's fatal four-day pea-souper

Thousands are estimated to have died after a thick polluted fog engulfed London for four days in December 1952.

https://www.usatoday.com/story/news/world/2016/12/13/scientists-say-theyve-solved-mystery-1952-london-killer-fog/95375738/

The smog was so thick that visibility was just one metre.

Those with respiratory conditions, the young and the old were most vulnerable.

In response, the government passed the Clean Air Act to reduce the use of smoky fuels.

Witness speaks to Dr Brian Commins, who worked for the Air Pollution Unit set up at St. Bartholomew's hospital i

http://www.thesomervilletimes.com/archives/85393

The Somerville Times Historical Fact of the Week – July 25

On July 25, 2018, in Latest News, by The Somerville Times

Eagle Feathers #158– The Highway

By Bob (Monty) Doherty

Since 1922, Route 28 has been the longest state numbered highway in Massachusetts. Beginning at the Orleans rotary on outer Cape Cod, it pushes its patchwork way north for 152 miles to the New Hampshire border at Salem. Route 28 meanders through six counties and, coincidently, 28 different towns. Today, as it traces its way over a half dozen former Colonial Turnpikes, it is called by many local names. In Somerville, it has been referred to as the Middlesex Fells Parkway, Route 28, the Northern Artery, and sometimes more affectionately as Monsignor McGrath Highway.

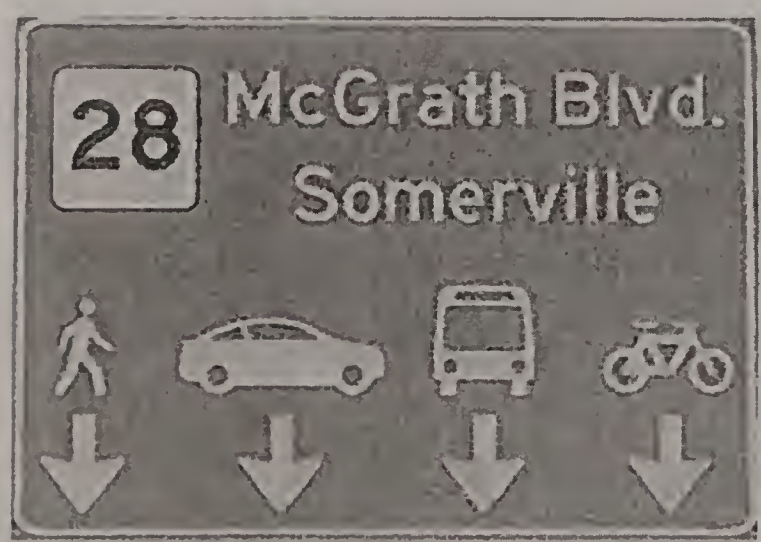
On November 29, 1869, Father Christopher T. McGrath founded Saint Joseph's Church in Union Square which was the first Catholic Church in Somerville. It will be 150 years old next year and was founded three years before Somerville became a city. Father McGrath kept his post there for over sixty-two years, and his residence during the initial church construction was at Poplar and Washington Streets in the heavily Irish-populated Brick Bottom section of the town. This was his original flock. They had come to America after fleeing the devastating famine of Ireland that had taken one million lives and reduced that country's population by half.

Father McGrath studied theology at St. Mary's Seminary in Baltimore during the Civil War where he was ordained a priest on December 23, 1865. While a seminarian, he had marched in President Lincoln's funeral procession just eight months earlier. Before his arrival, Somerville Catholics had to travel far to attend religious services; and by the end of his career, they had close access to seven parishes. He was a priest for sixty-six years and sixty-two of them were spent at Saint Joseph's Church and Schools helping and aiding Somerville residents. He did this for over three generations regardless of their faith and needs.

One of his students at Saint Joseph's achieved national fame by discovering Babe Ruth. It was Somerville's Brother Gilbert Cairns who worked at Baltimore's Saint Mary's Industrial School for Boys who scouted and coached the 18-year-old future "King of Swat" into the major leagues.

St. Catherine's Church

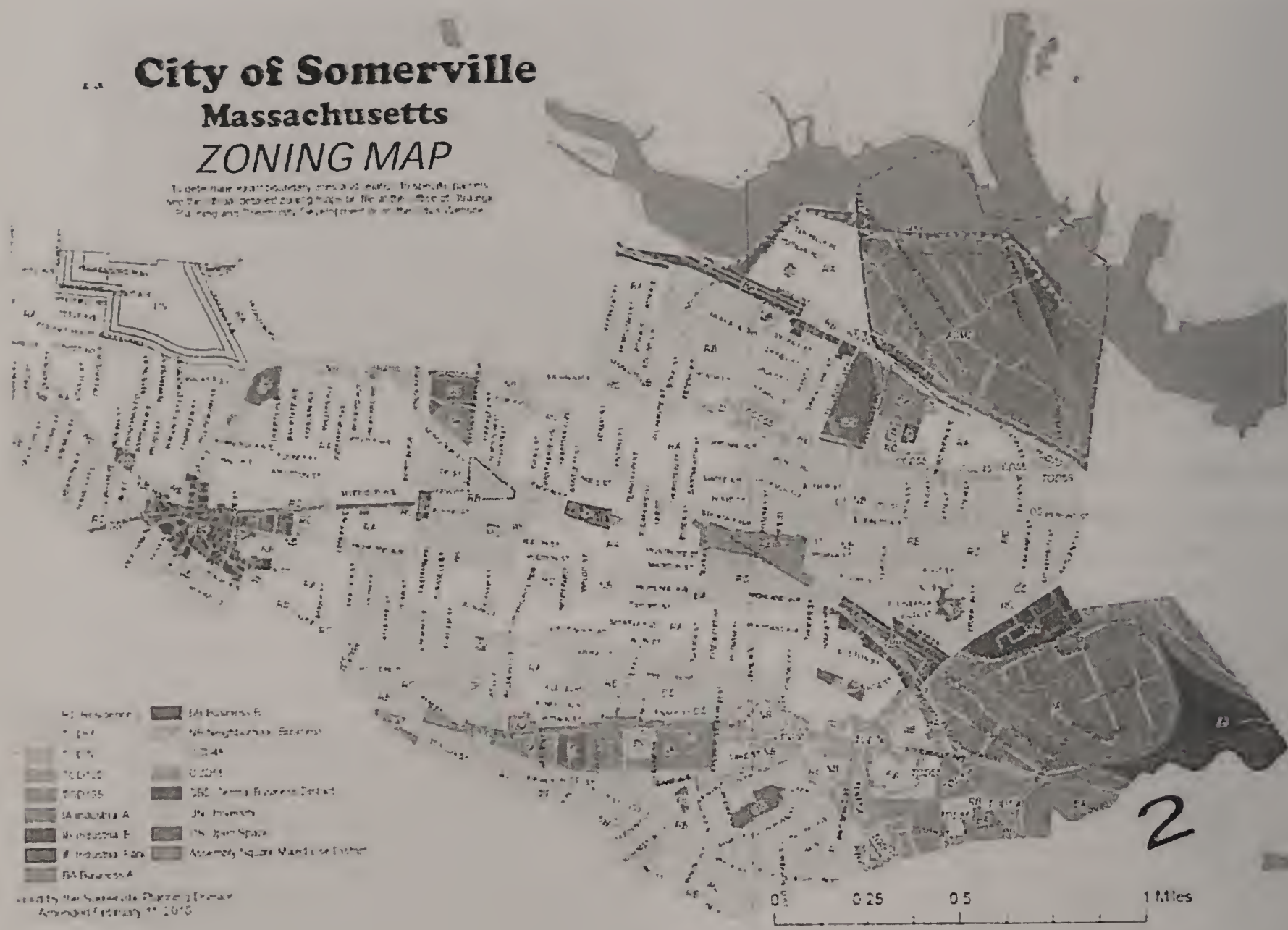
In 1925, the state built an expanded Route 28 connecting the road between the Charles River and the Mystic River. The section running through Somerville honors one of her favorite sons, Monsignor Christopher T. McGrath. Today, McGrath Highway is going through changes. Its size will be altered to accommodate motorists, bicyclists, pedestrians, and train travelers. With these changes, Christopher's highway may be turned into a boulevard, but the memory of a young priest who nursed thousands of Somerville residents through dark times, will always be remembered.



If you found this article of interest, please consider sharing it.

Father McGrath was elevated to Monsignor in 1920, and by that time had helped seven parishes including the beautiful Saint Catherine of Genoa, eight schools, and a home for the aged poor unfold. His cherished St. Joseph's Church, minus its 125-foot steeple, still proudly overlooks the city's oldest square.

At the time of his death, the citizens of Somerville poured out their grief. The city's flags were lowered to half-mast for thirty days. Businesses and city offices closed and thousands turned out to pay their respects during the funeral. A platoon of police and a detail of firefighters representing eight stations and eleven companies escorted the body from Union Square through Teele Square to the Arlington line where he was buried at St. Paul's Cemetery.


City of Somerville
Massachusetts
ZONING MAP
0.25
0.5
1 Miles
2

(/)

NOTICE OF MEPA CONSULTATION SESSION and COMMENT PERIOD EXTENSION

EEA No. 15889 Union Square Redevelopment, Somerville

The meeting will be held on: Thursday, August 2, 2018 at 5:30 PM at the Public Safety Building, 220 Washington Street (https://maps.google.com/?q=220+Washington+St.+A+site&entry=gmail&source=g).

A site walk (https://maps.google.com/?q=220+Washington+St.+A+site&entry=gmail&source=g) of the Phase 1 site (26 Prospect Street (https://maps.google.com/?q=26+Prospect+Street&entry=gmail&source=g)) will be held at 5:00 PM on August 2, 2018.

MEPA comments are due on or before August 24, 2018.

Certificate due August 31, 2018

Project Description: An Expanded Environmental Notification Form (EENF (https://eeaonline.eea.state.ma.us/EEA/emepa/mepadocs/2018/071118em/nps/enf/15889%20Union%20Square%20Redevelopment.pdf)) has been filed with the Executive Office of Energy and Environmental Affairs (EEA) by Union Square RELP Master Developer LLC (US2) and the Somerville Redevelopment Authority to construct a mixed-use development of approximately 2.4 million square feet (sf) in seven development parcels. The development program includes 1.15 million sf of office /lab space, 140,000 sf of retail space, a 93,000-sf hotel, 74,000 sf of arts/creative space and 933,000 sf (up to 998 units) of residential units, including 183-213 affordable units. The project will include 1,500 parking spaces, landscaped open space and bicycle and pedestrian facilities. The project site covers 15.7 acres and will increase impervious area by 1.15 acres. It will generate 23,239 average daily trip, use 143,417 gallons per day (gpd) of water, and generate 143,417 gpd of wastewater. The maximum building height will be 285 feet.

The project exceeds the following thresholds for a mandatory Environmental Impact Report (EIR): 301 CMR 11.03(6)(a)(6), generation of 3,000 or more average daily trips on roadways providing access to a single location and 301 CMR 11.03(6)(a)(7), construction of 1,000 or more new parking spaces at a single location. The project is located on landlocked filled tidelands and will require a Public Benefits Determination. It is subject to the MEPA Greenhouse Gas Emissions Policy. The project involves one or more land transfers from the Somerville Redevelopment Authority and permits from the Massachusetts Department of Environmental Protection, the Massachusetts Water Resources Authority and review by the Massachusetts Historical Commission

The Proponent has filed an Expanded Environmental Notification Form (EENF) with a request for a Phase 1 Waiver that would allow for the construction of Phase 1 to commence prior to completion of MEPA review of the entire project. Phase 1 involves development of the 3.5 acre D2 block and includes a total of 607,000 sf of development with 166,000 sf of office/lab space, 29,000 sf of retail space, 450 residential units (including

90 affordable units), 290 parking spaces and access facilities for the MBTA's planned Union Square Station. Phase 1 will add 1.83 acres of impervious area, generate 4,992 average daily trips, use 45,515 gpd of water, and generate 45,515 gpd of wastewater.

The Proponent's request for an extension of the comment period has been granted by the Secretary of EEA. The deadline for comments and the schedule for the issuance of a Certificate listed below incorporate the comment period extension.

A MEPA public consultation session will be held to receive advice and comments from agencies, officials, and citizens regarding which environmental issues, if any, are significant for this project. Opinions as to the extent and significance of possible environmental impact and the merits of the proponent's Phase 1 waiver request will be welcome.

Contact for project information: Geoff Starsiak, (978) 897-7100, gstarsiak@epsilonassociates.com (mailto:gstarsiak@epsilonassociates.com)

MEPA contact: Alex Strysky, (617) 626-1025, alexander.strysky@mass.gov (mailto:alexander.strysky@mass.gov)

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Union Square Somerville, MA. 'D2' US2

August 3, 2018

polygonLayer

Override 1

1:3,092

0 0.025 0.05 0.1 mi

0 0.04 0.08 0.16 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri

Generated from Cleanups in My Community. Date above is the date map was printed.

NORTH PROSPECT BLOCK REDEVELOPMENT PROJECT, SOMERVILLE

Background: The City of Somerville plans to revitalize the historic Union Square neighborhood for mixed-use transit-oriented development (TOD) adjacent to a planned Green Line Station. The Somerville BST has been assisting the City to resolve environmental issues related to the municipally-owned Kiley Barrel site located within Union Square. Soil at this site is contaminated with heavy metals, PCBs and petroleum. Groundwater is contaminated with chlorinated volatile organic compounds that have migrated into abutting residences, causing indoor air concerns. The former Kiley Barrel site will be assembled with an adjacent municipal parking lot and marketed for reuse as part of the North Prospect Block Redevelopment.

Former Kiley Barrel Company Site, Somerville

Somerville BST Accomplishments:

- $1,200,000 EPA cleanup grants awarded to the City for six parcels at the Kiley Barrel site, bringing the total funding award to $1,450,000 in assessment and cleanup funding under the EPA Brownfields Program.
- $950,000 MassDevelopment assessment and remediation grant awarded to the City in 2012, bringing the total funding from the Brownfields Redevelopment Fund to $1,342,400.
- $50,000 MassDEP assessment grant awarded from its EPA Brownfield Coalition grant.
- Technical assistance provided by MassDEP and EPA to the City and its consultant for completion of assessment activities and evaluation of remedial alternatives under the Massachusetts Contingency Plan (MCP) and EPA Toxic Substances Control Act (TSCA).
- Additional assessment of soil on abutting residential properties provided by EPA's Emergency Planning & Response Branch (EPA Removal). Based on data results, EPA Removal will develop and implement a remediation plan to address contamination in the top three feet where needed at three residential properties.
- Liability issues discussed with the Office of the Attorney General and state liability incentives identified.
- Assistance provided by the Department of Housing & Community Development (DHCD) as the City prepared its application for an Urban Renewal Plan.

Future Focus of Team: The Somerville BST meetings have officially ended. However, MassDEP continues to work with the City as it completes its final remediation design (Phase IV Plan) for the Kiley Barrel site. Significant funding provided by MassDevelopment & EPA, as referenced above, will enable the City to complete the necessary remediation that will result in the site being development-ready. In addition, MassDEP is working with EPA Removal as the additional assessment activities are underway at the residential properties. The City also continues to coordinate with MassDOT and the Massachusetts Bay Transportation Authority (MBTA) on the design of the future Green Line Station on Prospect Street.

Team Members: MassDEP (lead), MassDevelopment, MassDOT, MBTA, EPA, MA Office of the Attorney General, DHCD, MOBD, EOHED, Metropolitan Area Planning Commission (MAPC), City of Somerville.

Somerville's original independent newspaper

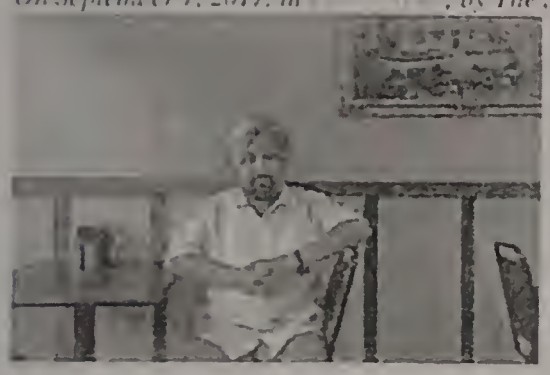
The Somerville Times

www.thesomervilletimes.com

Somerville 2015

The Somerville Museum's 'Union Square at Work' wins award

On September 7, 2017, in [illegible], by The Somerville Times



The Somerville Museum and Charan Devereaux's project "Union Square at Work: Photographs, Stories and Music from Somerville's Oldest Commercial District" has been honored by The American Association for State and Local History.

By Rebecca Dawers

The American Association for State and Local History (AASLH) has announced that the Somerville Museum and Charan Devereaux are recipients of an Award of Merit for the special project *Union Square at Work: Photographs, Stories and Music from Somerville's Oldest Commercial District.*

The AASLH Leadership in History Awards, now in its 72nd year, is the most prestigious recognition for achievement in the preservation and interpretation of state and local history. *Union Square at Work* is a revealing, visually stunning exhibit of photographs of the oldest commercial district in Somerville, paired with histories of local businesses and historic photographs.

In conjunction with the exhibit at the Somerville Museum, the project also orchestrated a series of local economic history lectures and panel discussions across the community, as well as concerts by Union Square's working musicians. In addition, the project released the Union Square Somerville Playlist, a collection of 20 songs by 20 Union Square bands and musicians in October 2016, now sold at retail locations around Union Square.

Presented at the Somerville Museum and later at the Massachusetts State House, the exhibition was critically acclaimed as historically important, not only for documenting a section of Somerville that is undergoing vast change, but also for its powerful stories about family businesses, immigration and economic transitions in neighborhoods.

A photographer, writer and producer, Devereaux utilized the Somerville Museum's collections along with the collections of Historic New England, the DeCordova Museum, the American Textile History Museum, Boston Public Library, Somerville Library, Harvard University and the Library of

Congress to place the stories and images of Union Square in the context of over 200 years of economic development.

The Museum and Devereaux wish to thank all of the participating Union Square business owners and employees, non-profit staff members, artists, volunteers and supporters for their contributions in bringing this project to reality. Special thanks to support from Mass Humanities, the Somerville Arts Council/Massachusetts Cultural Council, the Club Passim Iguana Fund, State Representative Denise Provost, the Massachusetts Historical Society's Gavin Kleespies, and the members of the Somerville Museum.

For more information, visit [illegible]. To view a selection of photographs from *Union Square at Work*, visit [illegible]. For more information on the Union Square Playlist and events visit [illegible].

This year, AASLH is proud to confer 48 national awards honoring people, projects, exhibits, and publications. The winners represent the best in the field and provide leadership for the future of state and local history. Presentation of the awards will be made at a special banquet during the 2017 AASLH Annual Meeting in Austin, Texas, on Friday, September 8. The banquet is supported by a generous contribution from the History Channel.

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Comments are closed.

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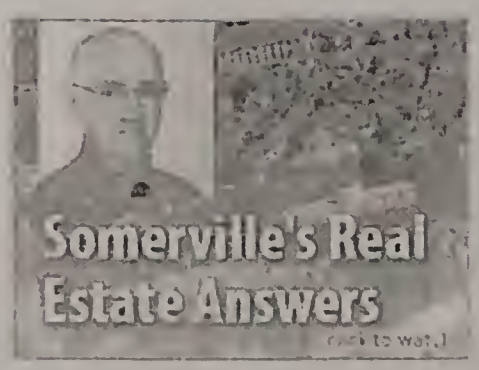

Best of Somerville

THE BEST OF
SOMERVILLE
2017

Features at a Glance

WIKIPEDIA

Coordinates: 42°22'37.72"N 71°5'39.45"W

Union Square station (MBTA Green Line "E" Branch)

Union Square is a planned rapid transit station on the MBTA Green Line "E" Branch in the Union Square district of southeastern Somerville, Massachusetts.[3][4] Union Square will have one island platform which will serve the "E" Branch's two tracks.[1]

In September 2013, the state secured funding to move forward on the Green Line Extension to build three new stations by 2017, signing a 51-month $393 million contract. Construction began in 2014 for Union Square, as well as Washington Street and the relocated Lechmere. After contract cancellations and delays, the station is expected to open in 2021.

UNION

A commuter rail train passes the Union Square station site in 2015

Location	Union Square Somerville, Massachusetts
Coordinates	42°22'37.72"N 71°5'39.45"W
Owned by	MBTA
Line(s)	Green Line
Platforms	1 island platform (Green Line)
Tracks	2 (Green Line) 2 (Fitchburg Line)
Construction	
Platform levels	2
Bicycle facilities	"Pedal and Park" bicycle cage[1]
Disabled access	Yes
History	
Opening	2021 (planned)[2]
Services	

Contents

History
- Green Line Extension
- Commuter rail

References

External links

History

Green Line Extension

In August 2012, the City of Somerville, MassDOT, and the MBTA reached a memorandum of agreement about the station. Through the Somerville Redevelopment Authority, the City will acquire $8 million worth of land for the station and grant the MBTA a permanent easement, while retaining the rights for transit-oriented development overhead. In return, the MBTA and MassDOT will pay for cleanup costs at the site, begin construction by the spring of 2014, and open the station no later than "late 2016-

early 2017".[5]

Preceding station	MBTA	Following station
Lechmere *toward Heath Street*	Green Line "E" Branch Starting 2021	*Terminus*

Planned station site in December 2011 before clearing

In October 2012, the Somerville Board of Aldermen approved the Union Square Redevelopment Plan and authorized an $8 million bond, including $6 million to purchase the land and $2 million for cleanup and station planning.[6] In May 2013, the Board of Aldermen announced that the North Prospect block - a mostly industrial area bordered by the railroad tracks, Prospect Street, Somerville Avenue, and the rear of residential properties on Allen Street - had been acquired by the city via eminent domain for $4.5 million. The properties were to be vacated by August. The city also received a $1 million EPA grant to clean up one of the properties.[7] Site cleanup began in September 2014.[8]

After major cost increases due to contractors increasing costs above estimates became public in 2015, MassDOT cancelled contracts and scaled back sections of the project. A new design released in May 2016 removed direct access from the Prospect Street overpass (which required elevators, escalators, and stairs) and platform canopies.[9] In December 2016, the MBTA announced a new planned opening date of 2021 for the extension.[2]

Commuter rail

Extant steps leading to the long-gone commuter rail station

Union Square was formerly a commuter rail stop on the Fitchburg Railroad (now the Fitchburg Line). Service to the station ended in 1938, likely in concert with the end of passenger service on the Watertown Branch.[10] A set of steps which led to the station is still extant next to Webster Avenue.

Restoring commuter rail service to Union Square has been considered; the 2004 state Program for Mass Transportation estimated such a station would attract 390 daily riders.[10] A Union Square commuter rail station was listed as a possibility in 2012 as an interim air quality mitigation measure in response to delays in building the Green Line Extension.[11] However, such a station would not be popular with riders from the rest of the Fitchburg Line, which is already slow due to closely spaced stations. The station could also not have been completed by the 2015 deadline, and was not supported by MassDOT.[11]

References

1. "Washington Street and Union Square Stations: November 6, 2014"

SCC.1 Site drainage.

Chapter 9 of the DEIR included information on the Project's incorporation of BMPs to address stormwater runoff mitigation.

Stormwater management facilities will be implemented on a Lot-by-Lot basis and will conform to all Stormwater Management Standards within the Massachusetts Stormwater Handbook to the maximum extent practicable. These on-site mitigation measures will decrease the peak rate of runoff for all storm events up to and including the 100-year storm event. By doing so, these on-site measures will provide relief to the existing (and proposed) City infrastructure that currently experiences surcharge and flooding during large scale storm events.

The Project will include a number of additional low impact development (LID) measures, where feasible and practicable. Building designs will consider blue and/or green roof technology to temporarily store stormwater, combined with rain water harvesting for irrigation. Permeable pavement will be substituted for traditional asphalt pavement in areas to promote infiltration and groundwater recharge. Additionally, rain gardens will be constructed in pervious areas to promote water quality treatment and groundwater recharge.

SCC.2 Kiley Barrel site.

Chapter 8 of the DEIR included information on the existing site conditions for all Blocks, including D2, and anticipated plans for the applicable sites to achieve a level of No Significant Risk. Specifically, Section 8.3 detailed the site history, regulatory history, and assessment and remediation approach.

SCC.3 Below-grade parking.

The feasibility of below-grade parking will be assessed on a site by site basis by US2. As it relates to the first planned parking garage on D2, US2 has analyzed an alternative D2 plan developed by members of the community that locates the parking underground. In considering this alternative design, US2 reviewed the plan to assess its benefits and challenges and also worked with a consultant to estimate the cost of the underground parking. Ultimately, the premium cost of the alternatives was cost prohibitive. The Project is not able to absorb the additional cost of underground parking, in addition to all of the other Project benefits, and remain financially viable. Project feasibility is further challenged by increased risk, significant schedule delay and design challenges associated with implementation of the alternative plan. See also the responses to comments USNC.2 and USNC.3 in the FEIR.

While the Project includes above-grade parking in some locations, the Project also includes the provision of below-grade parking on portions of D1, D3 and D6, where below-grade parking appears feasible. The feasibility of underground parking is very much site dependent and is not universally included in new developments in the metro area, particularly in suburban locations and in locations subject to flooding. Feasibility depends on the construction cost, site risks and the market conditions, among other factors. The construction costs include the premium costs associated with underground construction (e.g., excavation, shoring, dewatering, environmental remediation, etc.) as well as the cost of other benefits provided by the Project.

SCC.4 Accessibility.

Providing equal access to transit is an important element of the plan. US2 has been meeting regularly with the MBTA, the GLX contractor, and the City and will continue to meet as designs for the MBTA station and development advance in parallel. Accessibility is one of several matters of ongoing coordination and the parties will continue work to ensure that US2's design for D2 and the MBTA's design for Union Square Station provide access to the station that is compliant with both ADA and MBTA design standards. A product of this coordination to date has resulted in the redesign by US2 of the planned open space. As a result, a direct, at grade-accessible path from the station to Prospect Street has become a salient feature of the design. There are no planned ramps that will run alongside the Prospect Street sidewalk. A site plan that identifies site circulation as currently planned has been included as Figure 1-9 in the FEIR. In addition, Section 1.3 of the FEIR provides additional information related to the ongoing coordination with the GLX project.

SCC.5 Compatibility with the Neighborhood Plan.

US2's redevelopment plan area represents a portion of the 'Union Square' area described in planning documents (*SomerVision* and the Union Square Neighborhood Plan). It does not represent the totality of future open space. The Union Square Overlay District Zoning was adopted to codify the Union Square Neighborhood Plan targets and requires US2 to create more open space (25%) than what was recommended by the Union Square Neighborhood Plan (15%). The approved plan will deliver over 2.5 acres of new, public open space. US2's plan is compatible with the Union Square Neighborhood Plan in that it delivers above expectations.

The SRA prepared the Urban Redevelopment Plan (URP) and it was approved by the Commonwealth of Massachusetts Department of Housing and Community Development on November 19, 2012. The URP was based on the City's long-range plan, *SomerVision*, and was prepared in response to the MBTA having obtained funding to extend the MBTA Green Line and construct a new Green Line station at Union Square. The URP was premised on the extension of the Green Line and the new Union Square Station being a catalyst for the revitalization of Union Square and the adjacent Boynton Yards area of

Somerville. On December 5, 2013, the SRA issued a Request for Qualifications (RFQ) for a master developer to carry out the redevelopment of the Project site into a mixed-use project including retail, restaurant, and service establishments and commercial office, R&D and residential uses.

After Union Square Station Associates LLC was selected through the RFP process, the SRA and Union Square Station Associates LLC entered into a Master Developer Designation Agreement dated November 20, 2014, as amended by that certain Amended and Restated Master Developer Designation Agreement dated August 6, 2015 (collectively, the "MDDA"), US2 and the City created a Neighborhood Plan, and the SRA and US2 agreed to negotiate and enter into the MLDA to agree upon the general financial and non-financial terms which shall govern the Project and the D Blocks and address matters that include acquisition process, remediation responsibilities, phasing of construction and coordination with the MBTA and other financial and non-financial terms and conditions. The SRA and Union Square Station Associates LLC subsequently entered into the Master Land Disposition Agreement dated May 2, 2017 (as amended and assigned, the "MLDA"). The MLDA contemplates that Union Square Station Associates LLC will set up affiliated entities in order to facilitate development of the Project. In early 2018, the SRA acknowledged and consented to an assignment of the MLDA to an affiliate as contemplated by the MLDA, and following such consent, the MLDA and other permits related to the Project were assigned to US2, i.e., Union Square RELP Master Developer LLC. This assignment was formally acknowledged by the SRA pursuant to an Estoppel Certificate and Acknowledgment dated March 1, 2018, approved at an SRA board meeting. The assignment was completed pursuant to an Assignment and Assumption of Amended and Restated Master Developer Designation Agreement, Master Land Disposition Agreement, Development Covenant and CDSP dated March 16, 2018 by and between Union Square Station Associates LLC and its affiliate US2.

In furtherance of the URP, the City has enacted zoning amendments on June 8, 2017, creating a new Union Square Overlay District and providing for a process through which the URP would be implemented pursuant to a CDSP, and the Planning Board of the issued a CDSP as well as three additional special permits and two waivers in favor of Union Square Station Associates LLC pursuant to a written decision dated December 14, 2017 and filed with the Clerk of the City on December 28, 2017 and recorded with the Middlesex South Registry of Deeds in Book 70602, Page 1 and filed with the Middlesex South Registry District of the Land Court as Document No. 201801781416 (collectively, the "CDSP"), which CDSP was assigned by Union Square Station Associates LLC to US2 concurrently with the assignment of the MLDA as noted above. The CDSP contains detailed findings concerning the compliance of the development contemplated by the CDSP with the URP and a finding by the Planning Board of the City that the CDSP is compatible with not only the URP but with the City's overall master plan (*SomerVision*), the 2003 Union Square Master Plan, a 2016 Union Square Neighborhood Plan, the City's

Open Space Plan, the City's zoning ordinance, and the purposes underlying the Union Square Overlay District.

SCC.6 Exit/fire escape routes.

All buildings will be designed and built to all applicable codes. Plan reviews of all proposed buildings will be conducted by the City Inspectional Services Department to ensure these are standards are upheld prior to the issuance of any building permit.

SCC.7 Geotechnical integrity.

All appropriate analyses will be completed to ensure that the foundation methodology is appropriate for the proposed buildings. For each D Block, a specific strategy will be developed by structural and geotechnical engineers following the completion of geotechnical due diligence.

SCC.8 Sea level rise

Chapter 6 of the DEIR included information on climate change impacts and adaptation and resilience measures. The inland location of the Project protects it from coastal flooding. There is potential risk for the MBTA line (site low point) to flood; however, the lowest point onsite (D2.4) being 3.3 feet elevation helps protect the development. All other low points begin at 6.6 feet. This level of protection includes protection from a worst-case scenario of 2070 high tide models, which anticipate 36 inches of sea level rise. As an added level of protection from stormwater, each Lot design will explore protection of assets via placement of openings, protective architectural and site features, and through wet flood-proofing techniques at grade.

To ensure that mechanical systems are resilient to climate change risks, critical systems will be located above the 500-year floodplain, and where necessary, additional precautions such as wet-flood-proofing will be incorporated into buildings to minimize disruption in the event of flooding. Such measures will also be recommended within ground floor tenant guidelines.

23F Allen Street - Union Square
Somerville, MA. 02143

August 21, 2018

RE: EEA No. 15889 Union Square Redevelopment, Somerville MEPA Review
http://unionsquareneighborhoodcouncil.org/2-uncategorised/142-15889-mepa-consultation-session
https://en.wikipedia.org/wiki/Union_Square_station_(MBTA_Green_Line_%22E%22_Branch)

Mr. Alex Strysky – Agent
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114
phone: 617-626-1025
fax: 617-626-1181 **Email**: env.internet@state.ma.us

Dear MEPA Secretary Matthew A. Beaton;

I have lived at 23f Allen Street (front) but my family owns 21, 27A and 27 B and both 23F and 23 Rear for over 25 yrs. My husband, Frank passed away about a year ago and I am naturally anxious to preserve his legacy both for myself and my family.

I have recently learned more details about the planned GLX Green Line extension to Union Square and the US2 developer's plans for the D2 block on the corner of Somerville Ave. and Prospect Streets. As I understand it the present design calls for a three story 300 car parking garage to be built above ground in the center of this lot with a busy access road running parallel to Allen Street.

I am very concerned that this design will result in much disruption of my daily life, added noise and vehicular pollution in the area and diminished value to my properties as well as discouraging tenants from moving into this neighborhood.

In addition, the proposed MBTA station rather than welcoming riders into our historic Union Square shopping and restaurant district will provide a barrier and obstacle to commerce which new arrivals are asked to 'walk around' rather than be 'invited into' benefiting more the new occupants of a 25 story apartment tower as opposed to the long-standing residents of the community. JM.1

Unlike the proposed D2 parking garage which is part of the present proposed US2 plan, Norman B. Leventhal Park at Post Office Square in Boston's financial district illustrates what can happen when a visionary idea is realized through excellent design. Enormously popular from the day it opened, this 1.7-acre park is often credited with jump-starting Boston's downtown revival. Built on the roof of a 7-level underground garage, it continues to be a model of public-private cooperation and stands as an exemplar of contemporary design in harmony with its urban surroundings. The Park at Post Office

Square has become a model for center city parks in the 21st century, cited by designers, public advocates, municipal officials and educators, alike. (https://www.asla.org/2014awards/381.html)

Fortunately, the Neighborhood Council Built Environment Committee has had suggestions from at least four groups as to how the present US2 design might be improved with little basic change to their needs (https://docs.google.com/document/d/1DTyUjzFT6meYCXaq-vM852wXjBczfYp-OTLIHjqPZzs/edit). Philip Parsons who was Dir. Of Planning for Harvard Univ., Prof. Anne Tate, who's husband—the Rev. Bob Massie—is running for governor, Tim Talun, Wig Zamore—an expert on polution and urban design issues, Tim Talun, Janne Corneil, Sarah Radding, Bill Cavellini, and Rene Scott among others have taken there time to offer possible suggestions for improvement.

I only wish that I and my neighbors and friends had been better informed and updated as to the proposed plans for this redevelopment which is literally in our back yards. Naturally, we are very concerned about noise pollution, traffic and disturbances during the early morning and late night hours along this service road which backs into our homes and is planned over an existing brownfield area which might migrate into our area where tenants, family and grandchildren are living. We're also JM.2
anxious about the rodent population in the neighborhood, traffic, exhaust pollution and other disturbances to our normal way of life. Rather than having an open access to Union Square and the new MBTA station, it seems that this area between Allen Street and the Target store will be isolated and barricaded into a small corner of the city.

Thank you for your kind consideration of these matters. I appreciate the efforts of your department to ensure the safety and well-being of the resident community as well as the future development and newcomers invited into the region. We all need safeguards to protect our community and future development in the city. Thanks again!

Cordially,

Mrs. Jean Martelli (617)-666-1494 (home)

http://unionsquareneighborhoodcouncil.org/

D2 Parcel Project

The Design Review Committee met on Monday, August 20 to consider a new design proposal from US2. A public comment period was permitted, which was used by those attending mostly to express their dissatisfaction with the proposal. Another meeting is scheduled for August 30, before which public comments will be accepted in writing. More details will be provided soon. Three alternative designs for the D2 project have been submitted to the Built Environment Committee and the USNC board, both of which endorsed the underlying design principles embodied in those designs.
http://unionsquareneighborhoodcouncil.org/images/docs/180813-D2%20Site%20Design%20Alternatives.pdf

JM.1 Proposed MBTA station.

The proposed MBTA station is being delivered within a dedicated easement and railroad right-of-way. US2 is not responsible for the station design, however is actively coordinating with the MBTA to provide efficient access to the MBTA station through an accessible pedestrian plaza. US2 has been meeting regularly with the MBTA, the GLX contractor, and the City and will continue to meet as designs for the MBTA station and development advance in parallel. Access to and from the station is one of several matters of ongoing coordination and the parties will continue work to ensure that US2's design for D2 and the MBTA's design for Union Square Station provide unobstructed access to the station. A product of this coordination to date has resulted in the redesign by US2 of the planned open space. As a result, a direct and unobstructed, at grade-accessible path from the station to Prospect Street has become a salient feature of the design. A site plan of the D2 site that describes circulation has been provided as Figure 1-9 in the FEIR. In addition, Section 1.3 of the FEIR provides additional details regarding coordination between US2 and the GLX project team, including information regarding installation of an MBTA elevator as part of the GLX project.

JM.2 D2 access road.

The thoroughfare (or access road) planned along the eastern boundary of D2 is one of three permitted through-block connections within the Project area. The concept of the through-block connections was an outcome of the 18-month Union Square Neighborhood Planning process. In general, the thoroughfares are intended to serve two main purposes: (1) to breakdown the scale of the larger blocks in order to improve overall neighborhood circulation, and (2) to reduce the number of service and access curb cuts on the pedestrian streets to favor pedestrian mobility.

This access road will primarily serve vehicles, bicycles and trucks and is intended to serve as a point of service access to D2, but also as a future point of service access at the rear of the lots along Allen Street. This will ultimately serve to make Allen Street more pedestrian friendly, if and when, the properties along Allen Street are improved because their services can load from the rear of the lots. This was a specific goal of the City's Planning Staff, and rear/alley loading is common in many urban environments.

Throughout the course of the D2 DSPR process, US2 has also made several design changes in response to comments relative to the Project's interaction with the neighborhood to the east. The D2 plan includes the following:

- The Project will clean-up a contaminated lot (D2) that operated for decades as a scrap metal yard and that experienced significant truck traffic and noise directly visible and adjacent to the Allen Street properties.

- The building is setback approximately 25 feet from the east property line resulting in an average setback from the existing structures that face Allen Street of approximately 95 feet.

- A setback was added for a portion of the levels above the third floor to further reduce scale.

- The east façade treatment included more segmentation to further breakdown the scale of the façade.

- A landscape planting buffer was added along the southern length of the garage.

- A sidewalk was added adjacent to the alley.

In addition, US2 has collaborated with a group of community members, land owners (including Somerville Community Corporation) and the City ("Milk Square Stakeholders") who are doing some planning for potential future growth in the neighborhood east of D2. As part of their planning, the Milk Square Stakeholders have envisioned how Charlestown Street might be relocated to the north to facilitate better east-west connectivity to the east in the future. US2 revised the location of Charlestown Place on the D2 plan to move it further north in order to better facilitate this future condition.

Please refer to Figure 1-8 in the FEIR for a D2 site plan.

Philip J. Privitera

59 Union Square
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Friday, August 24, 2018

Matthew Beaton, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office / MEPA Analyst Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Via email to Mr. Alex Strysky
RE: EEA#15889, ENF, Union Square Redevelopment, Somerville MA

Dear Mr. Beaton:

I work in Union Square and am becoming active with the Union Square Neighborhood Council. I have some concerns with the building that U2 is proposing for the Union Square neighborhood. In particular, I have concerns about the proposed plaza, or "open space." This plaza is being set up to be right up against one of the most traffic heavy streets in Somerville. These streets are active most of the day, and are particularly heavily traveled during rush hours. The proposed plaza, we are told, is intended to be utilized by the public at large, which will include children. We all know that children playing do not always pay attention to what is around them and by putting the open space next to such a highly traveled street will endanger those children. FK.1

It would make more sense to utilize one of the alternative designs submitted by the Union Square Neighborhood Council that places the plaza into a protected area between the buildings. This would not only allow children to play safely, but will also encourage the utilization of that space by the public, by keeping it away from the various vehicles that travel the streets of Somerville.

Additionally, the increase in both traffic and pollution from the residents of a twenty story building and their vehicles will be significant. While we always support development and additional housing, we worry a lot about how this will impact an already heavily congested area. Particularly where those plans have already engendered so much resistance from the local community. FK.2

Thank you,

Frank J. Kautz, II

cc: Alex Strysky, Environmental Analyst, alexander.strysky@mass.gov

FK.1 **Child safety.**

All planned civic open spaces are intended for public use and will consider safety of all users as each design is developed. The current open space design being advanced adjacent the future Union Square Station has been continually evolving in direct response to community comments throughout the public process. US2 has improved the D2 design by increasing the size of the plaza by more than 33%. The plaza has also been widened to create greater horizontal separation from Prospect Street vehicles, while an additional 2,300 sf of new public open space has been provided more than 150 feet from the street. In addition to the safety provided by this horizontal separation, US2's redesign of the plaza from an elevated, stepping plaza to one that approximates Union Square Plaza's grade elevation creates vertical separation. A detailed site plan for the D2 site is provided as Figure 1-8 in the FEIR. Please reference Section 1.2.4.4 of the FEIR for a detailed narrative description of the plaza and its design.

FK.2 **Traffic.**

US2 has been working closely with the City on Project program, design, operations and areawide transportation (and other) improvements for several years. The Project's approach to mobility management, including transportation design, management and operations, responds directly to the City's neighborhood goals. Similarly, the City is executing an improvement plan for neighborhood public rights-of-way, as envisioned in the Union Square Neighborhood Plan, that supports these goals. Given the scale of the Project, there will be impacts to the transportation network and many of these were anticipated in and accounted for in the Union Square Neighborhood Plan and were integrated in the City's planned transportation improvements. Consequently, in working with the City, many of these impacts do not require significant independent mitigation, as they are part of the overall plan and program. For example, more pedestrians will be using sidewalks, but the pedestrian realm will still be safe and have capacity to handle this increase because the buildings are planned to be set back to create wider sidewalks, and streetscapes will be improved to be more pedestrian friendly.

Collaboration with the City and an understanding of their transportation goals has resulted in US2's investment in transportation improvements and mitigation being largely focused on expanding access and infrastructure for transit, pedestrians and cyclists, and efforts to reduce vehicle trips. The heart of the Project's transportation mitigation is the MMPs that will be required for each development Lot and US2's support for the GLX project (e.g., $5.8 million contribution, MBTA-related facilities on D2), which help make the stringent mode share goals possible. These are proactive measures that will be enforceable through the Project's permits and combine to help achieve the non-auto mode share goals for the Project. The Project's MMPs will require

US2 to advance progressively more aggressive TDM programs as needed to achieve these goals.

Section 4.5.7 of the DEIR specifically described the MMPs which will be put into place to achieve improvements in non-auto travel. Programs will be adjusted as needed to meet ongoing goals. A description of the anticipated Lot-specific MMP elements is also presented in Section 4.5.7 of the DEIR, along with information on how those elements aid employees, residents, visitors, residents, and retail patrons getting to and from the Project site. The Project team has developed Project incentives such as subsidized transit or bike-passes, shared vehicle services, carpool matches, preferential parking, alternative schedules, flexible hours, shuttles, telecommuting and the Guaranteed Ride Home Program to encourage alternative modes of travel.

August 30, 2018

Secretary of Energy and Environmental Affairs
Attention: Massachusetts Environmental Planning Act (MEPA) Office
Alexander Strysky, EEA No. 15889
100 Cambridge St., Suite 900
Boston MA 02114

Re: Comments regarding the MEPA Application #15889, called Union Square Redevelopment by Proponent UNION SQUARE RELP MASTER DEVELOPER, LLC.

Dear Secretary Matthew A. Beaton,

1. **The Alleged Proponent ("Proponent"):**
   a) The Somerville Redevelopment Authority (SRA) voted to choose Union Square Station Associates, LLC Exhibit 1 - 2. (Ex.)[1] as the Master Developer for the Union Square Urban Renewal Plan also known as the Union Square Revitalization Plan on June 26, 2014. Ex. 3.

   Prior to then and since, the Master Developer and the city of Somerville has worked to be known as US2, and is called such in multiple writings. Ex. 4. US2 is Not a legal entity in Baltimore, Massachusetts, or anywhere, but has become a colloquial term to obfuscate whom the real master developer is. For example, on the ENF pg. numbered 2, it states,

   > "The Somerville Redevelopment Authority will be transferring the land to US2 for the development of Phase 1 and may transfer additional land as needed pursuant to the Master Land Disposition Agreement with US2."

   b) The Master Land Disposition Agreement (MLDA) states the following. http://ifa.somervillema.gov.s3.amazonaws.com/documents/US2-SRA%20MLDA%20Executed.pdf

   > MASTER LAND DISPOSITION AGREEMENT
   > This MASTER LAND DISPOSITION AGREEMENT (this "Master LDA") is made this _2nd_ day of May, 2017 (the "Effective Date") by and between the SOMERVILLE REDEVELOPMENT AUTHORITY (the "SRA"), a redevelopment authority as defined in Massachusetts General Laws, Chapter 121B, with an address of c/o City Hall, 93 Highland Avenue, Somerville, Massachusetts 02143, and UNION SQUARE STATION

[1] All exhibits are attached paginated

ASSOCIATES LLC, a Delaware limited liability company, with an address of 225 North Columbus Drive, Suite 100, Chicago, Illinois 60601 ("US2", and together with the SRA, the "Parties").
BACKGROUND
A.The City of Somerville (the "City") prepared a long range planning document for the future known as "SomerVision". Subsequently, the Massachusetts Bay Transportation Authority ("MBTA") obtained funding to extend the Green Line and construct a new Green Line station at Union Square (the "MBTA Station"), currently anticipated to be ready for operation in June, 2021. As the extension of the Green Line and MBTA Station are expected to act as a catalyst for the revitalization of Union Square and the adjacent Boynton Yards area, the SRA and the City sought to facilitate private redevelopment to accomplish this anticipated revitalization. Pg. numbered 1. MLDA

At a meeting on June 26, 2014, taking into account the recommendations of the City's professional staff and the CAC, and citing the significant relevant experience and financial resources of **the US2 team**, the SRA voted unanimously to designate US2 as the master developer of the Disposition Parcels. Subsequently, **Richard A. Stein and Gregory Karczewski formed RAS Union Square Development, LLC, which together with Magellan US2, LLC are the sole members of US2, and Gregory Karczewski moved to Massachusetts and opened an office for US2 in Union Square to undertake the full time development of the Union Square Project.** Pg. 2. MLDA [Emphasis added]

RAS Union Square Development, LLC (Ex. 5.) http://rasdevelopment.com/usq was not "formed" by "Richard A. Stein and Gregory Karczewski" "together with Magellan US2, LLC (Ex. 6.) according to the recordings by the Secretary of State in Illinois where these entities are registered, and no proof of this is provided.

c) The Development Covenant[2] regarding the Union Square development between the city of Somerville and the alleged Master Developer states,

> DEVELOPMENT COVENANT
> This DEVELOPMENT COVENANT (this "Covenant") is made as of the ___[6]___ day of _____[June]_____, 2017 (the "Effective Date ") by and between the CITY OF SOMERVILLE (the "City"), a municipal corporation with an address of 93 Highland Avenue, Somerville, Massachusetts 02143, and **UNION SQUARE STATION ASSOCIATES LLC ("US2 "), a Delaware limited liability company with an address of 31 Union Square, Somerville, MA 02143.** pg. 1. [Emphasis added]

[2] Development Covenant does not appear to be a signed copy, but shows the entity, Union Square Station Associates, LLC, Delaware, as it is on the signed document. https://www.somervillema.gov/sites/default/files/US2%20-%20Development%20Covenant.pdf

that Union Square Station Associates, LLC is a Delaware limited liability company with an address of 31 Union Square, Somerville MA 02143. However, this address registered for this LLC in Delaware is 1209 Orange St, Wilmington, New Castle County, Delaware, 19801.

This Delaware limited liability company is not the same as Union Square Station Associates, LLC, recorded in the Commonwealth of Massachusetts Secretary Galvin's Corporate database that has an address of the Principal Office: 225 N. Columbus Dr., Ste 100, and the location of the Massachusetts office: 31 Union Street. (Ex. 1-2.) There is no 31 Union Street in Somerville, MA. The following article states "The US2-Workbar partnership will operate a shared workspace at 31 Union Square. . ."[3] However, the MLDA states that the SRA voted to designate Union Square Station Associates, LLC of Delaware the Master Developer. Ex. 1.

> Union Square Station Associates (US2), the City's master developer partner for Union Square's revitalization, and Boston-based coworking space network Workbar announced today that they have partnered to bring their membership-based coworking network to Union Square.
>
> The US2-Workbar partnership will operate a shared workspace at 31 Union Square,

d) The Coordinated Development Special Permit[4] application states,

> DESIGNATED MASTER DEVELOPER, Union Square Station Associates LLC (US2), 31 Union Square Somerville, MA 02143, Greg Karczewski, President, 617.996.8255, greg@unionsquarestationassociates.com Pg. 2.

And the Coordinated Development Special Permit approved states,

> Applicant Name: Union Square Station Associates LLC

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[3] US2 And Workbar Announce Partnership To Offer Shared Coworking Space https://www.workbar.com/posts/us2-and-workbar-announce-partnership-to-offer-shared-coworking-space (copy attached to email)

[4] Coordinated Development Special Permit Application https://www.somervillema.gov/sites/default/files/UnionSquare_CDSP-Application-%5BRD%5D_part1_0.pdf

Coordinated Development Special Permit Approved https://www.somervillema.gov/sites/default/files/USQ_CDSP-Decision_121417-FINAL_withattachments.pdf

However, the MEPA application states the Proponent is, "**UNION SQUARE RELP MASTER DEVELOPER LLC (US2)**", (Ex. 7.), which is not the entity that the SRA voted to designate as the Master Developer for Union Square.

e) On June 26, 2014, The SRA designated Union Square Station Associates, LLC of Delaware the Master Developer of Union Square and who they would transfer the property to, who is not the Proponent of the MEPA application. Therefore, can the Master Developer, designated by the SRA, transfer their status to another entity? If so, does it need to be in the public domain, so that the citizens of Somerville can see how the profitable benefits bestowed on the Master Developer by Somerville were transferred, to whom, and for how much? SCM.1

How did the citizens of Somerville, MA get from the Union Square Station Associates, LLC, of Delaware, to the **UNION SQUARE RELP MASTER DEVELOPER LLC** as Master Developer and how does MEPA know who the rightful and legal entity is that they are considering certification for?

d) The Public Notice of Environmental Review was advertised on July 4, 2018 at a time of the year when people are paying particular attention to The Somerville Times Legal Ads. The ad states the Proponent as being,

> PROPONENT: Union Square RELP Master Developer LLC and Somerville Redevelopment Authority. The undersigned is submitting an Environmental Notification Form ("ENF") to the Secretary of Energy & Environmental Affairs on or be-fore July 2, 2018 Ex.8.

2. Setting up the MEPA Meeting

Mr. Alexander (Alex) Strysky sent me an email on July 13, 2018 (Ex. 9. email 1)) informing the recipients that the MEPA meeting would be held on August 2, 2014 saying in part,

> "The consultation session/public meeting will be held on August 2 at 6:00 PM at Workbar, 31 Union Square. There will be a brief walk around at the D2 site, 26 Prospect Street, at 5:30. The Environmental Monitor will be updated with this information on Monday. Please let me know if you have any questions."

I responded to Mr. Strysky by explaining that Workbar at 31 Union Square was a private business that Workbar partnered with Union Square Station Associates, LLC. Ex. 9. email 2).

US2 And Workbar Announce Partnership To Offer Shared Coworking Space

https://www.workbar.com/posts/us2-and-workbar-announce-partnership-to-offer-shared-coworking-space **(copy attached)**

Mr. Strysky changed the location. It was likely that this location was recommended to him by the alleged MEPA Proponent. However, Mr. Strysky did not consider the neutrality of the location. Ex. 9. email 3). This raises the concern of his rubber stamping the undue environmental impacts of the proponent's application for the proposed 3.5 acre site on the D2 Block and the proposed 15.7 acre site, including, but not limited to

1) VTPD;

2) information regarding the impacts of the Miller's River, which has been long filled in, however water seeks it and fills it;

3) factual support for the sewer pipe offsets that were promised at the MEPA meeting by the Proponent's engineer, such as agreements, should be provided, as I requested in my email to Engineer Holmes, which he did not respond to;

4) whether the proposed green space is in an area that will attract people to it that is not safe with increased pollutants such as 1) particulate matter pollution, such as PM10, 2.5, etc.,[5] 2) exhaust, 3) carbon dioxide, 4) greenhouse gas emissions[6] 5) Nitrogen Dioxide, NO2, and 6) Volatile Organic Compounds, VOC's, 7) flooding, 8) sewer impacts, 9) impervious surface, 10) over density, 11) congestion, 12) and all the environmental impacts of the enormous proposed development, including, but not limited to, the mental, social, and physical health effects and disease that would result. **("Pollution")**[7].

5) what the health effects of the Pollution is; and

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[5]Particulate Matter (PM) Pollution – Federal
https://www.epa.gov/pm-pollution
[6] Greenhouse Gas
https://en.wikipedia.org/wiki/Greenhouse_gas
[7]Criteria Air Pollutants - State
https://www.mass.gov/service-details/criteria-air-pollutants#particle-pollution

6) whether the amount of public parking next to and in close proximity to a GLX train station is inadequate and will result in increased emissions and particulate matter and other pollutants by increasing the number of drive through trips, etc.

3. **MEPA Meeting**
   a. The MEPA meeting held on August 2, 2018 was unsatisfactory.
   Mr. Strysky stated in his email on July 17, 2018 (Ex. 10.) in part in bold lettering,

   > **The meeting will be held on: Thursday, August 2, 2018 at 5:30 PM at the Public Safety Building, 220 Washington St. A site walk of the Phase 1 site (26 Prospect Street) will be held at 5:00 PM.**

   b. **Site Meeting:**
   At 5:00 pm, some 25 people of which 18-20 were with the proponent were on the corner of Prospect St and Somerville Ave. It was some 90° Fahrenheit with direct sun.

   Mr. Strysky began having a private conversation with Mr. Karczewski. An attendee asked essentially if the meeting had begun. As it was unclear, I asked Mr. Strysky if the site visit had started. Mr. Strysky stated that the site walk was for his benefit as he had not been there before and that he would be essentially speaking with the Proponent to learn about the site. Mr. Karczewski stated that the site was dangerous to walk on so that we would not be going onto it. Then Mr. Strysky and Mr. Karczewski had a private conversation while walking from Somerville Ave at Prospect St to Allen St. The group followed. The walk stopped at 49-51 Allen St. where Mr. Karczewski pointed to a map while talking with Mr. Strysky in voices that were for their benefit. I walked to approximately 2 feet from them to see if I could hear, but I did not hear enough to make sense of the conversation as their voices were not intended for the larger audience. I heard Mr. Krczewski say "platform". This was not a public site walk with any information provided to the public to learn of the environmental impacts or to get a visual sense of areas the following meeting may discuss regarding environmental impacts.

   c. **Indoor MEPA Meeting, Mr. Strysky's Presentation:**
   When Mr. Strysky and Mr. Karczewski finished their essentially private meeting, they walked to the Public Safety Building at the Police Headquarters at 220 Washington St, Somerville MA 02143. Mr. Strysky made a presentation that did not touch on any of the environmental impacts of the proposed MEPA application. He discussed the process that would be on the Environmental Monitor regarding the possible outcomes and next steps as it related to comment periods, which was still unclear,

but there is a schedule of sorts. The Environmental Monitor is limited in its informational use. It is difficult to search on it without the date it was posted on the Environmental Monitor and/or the project number, which is not automatically known or easily known how to find. After Mr. Strysky's presentation, I asked him when the information regarding the environmental impacts would begin. He said the Proponent would make that presentation next.

d. **Sales Presentation:**
Mr. Greg Karczewski made a sales presentation that went on for a long time selling the benefits of his proposed development that did not address environmental impacts that it would create. Little and incorrect information was provided for the 3.5 acre site on the D2 Block, which is the subject of the Phase 1 Waiver. He gave No information regarding the 15.7 acres including the other 6 Blocks was spoken of. A bare reciting of some of the following was said, such as, there will be 290 parking spaces, but none of the environmental impacts were discussed.

> "3.5 acre D2 block and includes a total of 607,000 sf of development with 166,000 sf of office/lab space, 29,000 sf of retail space, 450 residential units (including 90 affordable units), 290 parking spaces and access facilities for the MBTA's planned Union Square Station. Phase 1 will add 1.83 acres of impervious area, generate 4,992 average daily trips, use 45,515 gpd of water, and generate 45,515 gpd of wastewater." Ex. 10.

In addition, "4,992 average daily trips" is not the number given at the MEPA meeting or on the ENF for Phase 1.

e. **Sewer:**
Somerville Director of Transportation & Infrastructure Brad Rawson spoke of how much the residents of Somerville need an updated sewer system. However, that could be said for many municipalities in the North East region of the U.S.A. In addition, the sewer repair is being funded by a $63 million dollar bond thrust upon the Somerville taxpayer, along with tens of millions of other bonds appropriated to be paid for by the taxpayer for the infrastructure and surrounding area of the proposed development, which has and will cause their taxes and rents to increase. And, which has significantly cleansed the area of certain people, which is a different type of environmental impact that you likely do not have jurisdiction over. Therefore, the proposed development is not mitigating sewer systems, since the sewer could and should have been repaired for the people who live here for their benefit. At the MEPA meeting, Mr. Rawson was selling that the proposed development was needed to fix the sewer infrastructure,

but he did not say that sewer infrastructure is for the Proponent's profits paid for by the taxpayer.[8]

f. **Environmental Contamination:**
Questions of environmental contamination on the site were asked and Ileen Gladstone P.E., LSP, LEED AP of GEI Consultants took the podium despite that she said she is not the current LSP of the site nor has she been. She gave a general rundown of essentially that the D2 block site was significantly contaminated despite that some cleanup had allegedly been done. Where did the millions of dollars in Brownfields grant money given to the city to clean up the site go and who is paying for additional clean up? When will it occur, and does it impact the certification of MEPA? Ex. 11. Another woman consultant said the buildings proposed for the D2 block would act as a cap on the contamination and that there is a cloud of noxious gas coming from the Kiley Barrel site.

The above information was provided as though this was part of the environmental impacts of the Proponent's development project. However, any toxic cleanup of the site is allegedly overseen by the LSP of record and the owner of the site that is supposed to follow laws and regulations regarding cleanup and the Department of Environmental Protection. MEPA has often certified contaminated sites well before cleanup, which does not appear to make the contaminated site a part of the environmental impacts, or perhaps there is another explanation for this.

g. **Wig Zaymore:**
Wig Zaymore spoke for the proponent's consultant above, but did not disclose who he represents and why. As the meeting went on for more than three hours, Mr. Zaymore got out of his seat in the row in front of me and one seat to the left and walked to Mr. Strysky in the seat behind me. Mr. Zaymore asked him when the meeting would end. I said I wanted to get some information on environmental impacts, including, but not limited to sewer, and traffic, which I had not gotten yet.

I said to Mr. Zaymore, but you can leave. However, it appeared that Mr. Zaymore knew that Mr. Strysky saw Mr. Zaymore as a consultant of sorts on the facts of the development and Mr. Zaymore did not want to leave before the meeting ended in case he was needed. Mr. Zaymore is on Mr.

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[8] AN ORDER MAKING AN APPROPRIATION OF $63,000,000 FOR THE COST OF FINANCING VARIOUS STREETSCAPE AND UTILITY INFRASTRUCTURE IMPROVEMENTS, LOCATED IN THE AREA OF UNION SQUARE TO MCGRATH HIGHWAY, AND AUTHORIZING THE ISSUANCE OF NOT EXCEEDING $63,000,000 BONDS OF THE CITY TO MEET SAID APPROPRIATION
Somerville Agenda Item 204438
http://somervillecityma.iqm2.com/Citizens/Detail_LegiFile.aspx?ID=17154&highlightTerms=204438

Strysky's email to a list of tens of employees at the state, directly after several employees, departments, and the Mayor of Sómerville. Ex. 10. Though he speaks for the Proponent by correcting its facts and providing their information, he has own bias. Mr. Zaymore is certainly entitled to his opinion and can submit his comments as such, but he should not act for the Proponent or the city unless he is working for them, which he should disclose.

h. **Indoor meeting content:**
As the sales meeting belabored on, I asked Mr. Strysky some four times successive intervals when would the discussion of the environmental impacts begin. He said, they will get to it, they will get to it. But, they did not, and he had to ask out loud for discussions regarding traffic and sewer impacts.

i. **Vehicle Trips Per Day (VTPD):**
As the meeting was in its 3rd hour, a women spoke with Mr. Karczewski. I asked how many additional cars would be added to Union Square due to the proposed project, and Mr. Karczewski stated that there would be an additional two thousand (2,000) Vehicle Trips Per Day added to Union Square, which was alarming.

I asked if they would provide a video of how many cars are there now and then show the traffic flow with the addition of two thousand cars, but there was no response. Mr. Karczewski or his consultant did not give the VTPD stated on the ENF, which I found after the meeting is stated on pg. 2 of the ENF to be 2,100 adjusted VTPD. The number he gave of 2,000 VTPD was allegedly for the Phase 1 and was factually incorrect to minimize the response. Mr. Karczewski and/or no one at the meeting distinguished that the incorrectly stated "2,000" cars was for the 3.5 acre site of the Phase 1 Waiver request, and there was no information given about the proposed adjusted VTPD of 9,700 for the 15.7 acre site.

j. **Engineer Frank Holmes of Stantec, Inc.:**
Mr. Holmes stated that the sewer would travel from the site, which I assume was the D2 Block, to Prospect St. to Somerville Ave to the Sullivan Sq. pump station. However, resident Wig Zaymore allegedly corrected him and said it would travel from the site to the Mystic River master pump along with more explanation, and Lori (?), another consultant to the alleged proponent, said to the pump station, which I assumed she meant for Mystic River.

4. **Burden of a poorly planned MEPA meeting:**

a. I left my home at 4:30 p.m. to get a ride, park, and walk to the site visit by 5;00 p.m., which was not be a productive use of time. Then, the sit down meeting went on for close to 3 hours before minimal substance regarding the environmental impacts began around 8:00 p.m. I had not had dinner at this point, nor did I think I would have to sit through the sales portion of the meeting to hear about what the proponent described as benefits to the project and how we needed it.

I expected to hear facts about environmental impacts of the proposed development before 8:00 p.m. However, I had to force myself to wait for the alleged environmental impacts portion of the meeting, which was minimalistic and put forward only after Mr. Strysky requested it. However, factual misinformation by the Proponent and his consultants were stated. This meeting was designed and succeeded to obfuscate the enormity of the environmental impacts being thrust on the area residents, which serves the alleged Proponent.

After speaking with MEPA Director Deirdre Buckley on August 6, 2018, she directed me to the Environmental Notification Form pg. 2. Under TRANSPORTATION that there would be an adjusted number of "Project Vehicles trips per day for the total project of 9,770" and for the Phase One requesting a Waiver of 2,100. This was the first time I learned that the number given of 2,000 VTPD by the Proponent at the MEPA meeting was incorrect. The difference of 100 vehicle trips per day (VTPD) in a densely trafficked area is not a throw away amount.

5. Union Square Plan of 117 acres.

The Proponent would like the 3.5 acre D2 Block to be reviewed separately as a smaller section of the enormous proposed development on the 15.7 acre site, which is part of the 117 acres of Union Square, which is designated to be developed. Each size would have significant environmental impacts and adverse health effects. However, to lessen the scope, the Proponent is applying for smaller sections at a time, as opposed to thrusting the whole environmental disaster on the public at once.

6. 498 page Environmental Notification Form[9]

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[9] ENVIRONMENTAL NOTIFICATION FORM
Submitted by: Union Square RELP Master Developer LLC And Somerville Redevelopment Authority
Prepared by: Epsilon Associates, Inc.
3 Mill & Main Place, Suite 250
Maynard, MA 01754

As the MEPA meeting provided inadequate information regarding the environmental impacts for the 3.6 acre area of the Phase 1 Waiver or any information on the 15.7 acre area, the only way to be familiar with both of them is to read the ENF's. The ENF for the Union Square Redevelopment is a 498 page document, which is formidable for the lay person, particularly for those who have other responsibilities. If MEPA requires the proponent to have a meeting, it should be factually informational not a sales pitch. For the sheer enormity of this proposal, MEPA should request more than one informational meeting.

7. Request for another MEPA meeting

Another informational meeting(s) can also be accomplished by not certifying the Phase 1 Waiver and MEPA then requiring a meeting(s) that presents solid, factual information about the environmental and health related impacts and consequences as opposed to sales presentations.

Such meeting(s) should include, but not be limited to Land; Structures; 2) Transportation; 3) Wastewater, which was minimally discussed and wrong facts were given; 4) Project Description was inadequate as to significant environmental impacts; 5) Project Program; 6) Civic Space did not discuss impacts of the lowest green space per person in the Commonwealth of Mass and its effects to the environment and human health; 7) Parking was minimally mentioned, such as, the number of 290 was given as it relates to the 3.2 acre D2 Block; 8) A discussion of cars did not distinguish that 2,000 additional VTPD was for the Phase 1 Waiver, which was incorrect, and did not at all discuss the adjusted projected VTPD of 9,700 for the full application; 9) Water as it relates to flooding and the effect of Miller's River; 10) Storm water and reduction of impervious surface as it relates to the city at large; 11) Historic Resources; 12) Identified Vulnerabilities; 13) Flood Risk beyond being shown a federal flood map; 14) Urban Health

Island Effect; 15) Construction effects as it relates to traffic, parking, shopping, air quality, etc.; 16) and Primary Use Allocations.

8. **False Promises to the Public**
   a. For the past several years, Mayor Curtatone has preached to Somerville residents that we need the Green Line Extension (GLX) to reduce the number of cars in Somerville and reduce the particles that emit from cars and he reminded us that Somerville has the highest amount of particulate matter pollution in the State, which he said has negative health impacts. Ex. 12. At the Arganziano School around 2008, at a public meeting (though it may not have been subject to the open meeting law) he stated that he had "particle disease" due to growing up with the bad air in Somerville due to Rt. 93.

   b. Wig Zaymore has spoken publicly regarding particle contamination in Somerville and its health hazards, essentially that Somerville has the worst such hazard in the Commonwealth, that the GLX is required to reduce Pollution. That essentially the GLX was to mitigate the environmental impacts of the Big DiG and assist Somerville to get cleaner air. He repeats over and over publicly that Somerville has the highest particulate matter pollution in the state and, as a result negative, health consequences. Ex. 12.

   c. Conservation Law Foundation (CLF) attorney Rafael Mares, has argued for years that a focus of the GLX is to reduce environmental impacts to the environment and humans.

      Green Line Extension Back on Track, Nov 25, 2017 Rafael Mares | @RafaelMares2

      https://www.clf.org/blog/green-line-extension-back-track/ Ex. 13.

      "Ultimately, moving forward the Green Line extension is good news for . . our climate, and our communities. Increased and equitable access to public transit . . . helps us opt out of driving, and improves air quality all around. CLF has worked for more than a decade to see this project through. . ."

   However, the Green Line Extension (GLX) is integral to the Urban Renewal Plan where the SRA is transferring property they have taken by eminent domain to the Proponent in order to build a 24-27 story tower with elevator accessing the Union Square station platform. The GLX is not an excuse to increase Pollution.

   d. **Metropolitan Area Planning Council (MAPC) Executive Director Marc Draisen,** spoke publicly in front of the Massachusetts Department

of Transportation (MassDOT) Board and the Fiscal and Management Control Board (FMCB) that essentially the GLX is needed to reduce pollution and mitigate the pollution from the Big Dig among other of his comments.

e. **Somerville Alderman At Large William A. White, Jr.,** has said publicly numerous times over the past years essentially that the GLX was essentially owed to the city to offset the harms of particulate matter to the city since Rt. 93 cut through it and to offset the environmental impacts of the Big Dig.

f. **US Congressman Michael Capuano of Union Square, Somerville** On August 29, 2018 at a7:25 p.m. to 8:13 p.m. Mr. Capuano telephoned his constituents for what he calls a "Telephone Town Hall" from 617-949-1047. A question was posed by a man who said he lives under flight traffic who was concerned about the resulting noise but mostly about the resulting particulate matter. He said that many a study had been written about its effects and that it would essentially reduce his life expectancy. He said he was considering moving. Mr. Capuano said tried to show his concern with particulate matter and said, "I have had asthma my whole life." It is well known that Mr. Capuano was born and raised in Somerville until today. He also said during the "Telephone Town Hall" that he fought for funding for the GLX to improve air quality.

g. Countless other similar comments have publicly been made that the GLX was to reduce particulate matter by reducing the need for cars and increase environmental and human health.

9. Vehicle Trips Per Day aka Traffic

To tale a realistic reality check of basic math and car flow relative to the streets available, by dividing 2,100 VTPD by 14 hours per day in the 3.5 acre Phase 1 area, you get an average of 150 additional cars traveling through per hour. However, there would likely be more VTPD expanded during rush hour. As the streets are already full of congestion, adding this many cars will be harsh for the area, environment, and bad for human health where I live. No improvement. This would push the backup of traffic outward significantly clogging up more of Somerville than is already clogged and causing cars to idle in place for longer periods of time increasing Pollution. At rush hour, there could be 300 vehicle trips per hour. There was no discussion of the environmental impact of the, 1) particulate matter pollution, such as PM10, 2.5, etc.,[10] 2) exhaust, 3) carbon

[10] Particulate Matter (PM) Pollution – Federal
https://www.epa.gov/pm-pollution

dioxide, 4) greenhouse gas emissions 5) Nitrogen Dioxide, NO2, and 6) Volatile Organic Compounds, VOC's, whether it be in parts per million or some other measurement that would result from the 2,100 VTPD in the Phase 1 area or the adjusted 9,700, VTPD in the total 15.7 acre area. The latter number was not mentioned or discussed. There was no discussion as to the effects on human health with this excessive increase, which should include, but not be limited to mental, social, and physical health, effects and disease that would result. Driving to and from your home, should not be dramatically more stressful where I live. The above VTPD would be added to the most densely populated city in New England on already densely, heavily traveled roads.

Adding 9,770 adjusted car trips per day to the current overload in Union Square would dramatically increase Pollution, which is bad for the environment and human health and may violate the Memorandum of Understanding that required a reduction in Pollution and the results from the case that CLF brought in 2005 to enforce the mitigation of the environmental impacts of the Big DiG.

a. Huge development of buildings for developer's profit is the basis of the high number of VTPD.

The basis of the VTPD is a huge development on a relatively small area of land. It is too tall, too large, too dense in terms of units and too densely populated for the area. This is the basis for an unreasonable number of cars that cannot fit onto relatively small roads and small square footage of roads in the most densely populated city in New England with currently most particulate matter and other pollutants in the air of any city in the Commonwealth of Mass. The current real estate development plan adds greenhouse gas and more Pollution. Commercial

Certifying the Phase 1 Waiver area or this total project application would ensure that people will live and visit a space with unsafe air and other Pollution, lack of green space relative to the development, etc., that cause health problems. Unsafe air leads to disease, and it is well written about that Somerville already has bad air that the politicians, the Conservation Law Foundation, and others promised for years the GLX was supposed to improve.

However, the irony of ironies is that the development based upon and integrated into the GLX, would serve to reduce the air quality significantly from what it is now. This does not square with the result of the CLF's 2005 case. It defeats the entire purpose of the GLX. And, at no

time was it disclosed in any of the meetings, hearings, documents, etc., that the development would add significant bad air quality, worse than what we have already. It was promised that the GLX would increase air quality and improve health, but it has turned into a project that is going to generate significantly more VTPD than we have now, which will add Pollution and would increase disease and bad health effects, which defeats the purpose of the mitigation from the 1997 MOU and the 2005 CLF lawsuit. This proposed development is based upon a lie to the public.

10. GLX and Big Dig Mitigation

The Green Line Extension is related to the Big Dig mitigation and Conservation Law Foundation (CLF) litigation on that issue.

Attached to email are the following.

1) the 1990 Memorandum of Understanding (MOU) between the Secretary of Transportation, Commissioner of Public Works, and CLF Executive Director regarding Traffic and Air Quality Mitigation for the Central Artery/Third Harbor Tunnel Project aka Big Dig.

2) The complaint filed in federal court by CLF in 2005 to enforce the MOU. The latter document has a list of the mitigation projects that had not been completed by the filing of the litigation.

On December 19, 1990, a Memorandum of Understanding: Traffic And Air Quality Mitigation For The Central Artery/Third Harbor Tunnel Project (MOA) required mitigation to the pollutants and environmental impacts as a result of the Big Dig. This MOA was not being followed and in 2005 the Conservation Law Foundation (CLF) filed a lawsuit to enforce the 1990 MOA, which resulted in a list of projects that would mitigate Pollution by reducing VTPD, bad environmental impacts to the environment and harmful human health effects from the Big Dig. The Green Line Extension is listed as one of those projects.

The GLX served as a magnet for the city to take property by eminent domain to transfer to an alleged developer to develop buildings that have elevators that empty and leave from the GLX platform of the Union Square station, to use air rights over the tracks, to add bicycle parking for riders to take the GLX, and to significantly reduce public parking in the area. This development integral to the Union Square MBTA station does not minimize the environmental impacts of the Big Dig. It should not be allowed to wipe out and exceed improvements to air quality promised by the local, state, and federal officials and governments, by substantially increasing VTPD in Union Square, whether 1) to get to the GLX Union

Square stations also known as drop off, or 2) to drive around the proposed huge development that is oversized for the current streets.

Adding 2,100 VTPD in on the 3.5 acre D2 Block per the request for the Phase 1 Waiver and 9,770 VTPD to the 15.7 acre site to the current overload of cars in Union Square would dramatically increase Pollution and produces disease.

The number of the parking spaces in the 15.7 acre site was significantly lowered. And, the Union Square Overlay zoning contemplated the GLX publicly in its structure. Therefore, the GLX is integrally figured into the calculation of the Proponent's development, and this results in significantly increasing bad air Pollution and other pollutants and bad health effects.

11. Department of Transportation

The Department of Transportation (DOT) said their comments are generally boilerplate in that they look at how access is maintained to DOT's state highway system that they maintain and roadways that they maintain that relate to the MBTA system for coordination with transit and other modes of transportation. That they look at the drop off trips and traffic accommodations on streets that they maintain. But, not when the roadways are not theirs. However, their position is that the bicycle parking proposed is increased presumably to get bicyclists to the GLX. This substantiates that the Proponent's project is integral to the GLX, which ultimately and dramatically increases air pollution.

In addition, the DOT commented on the proposed traffic parking as it relates to the GLX Union Square station, which is increased from what it would be without the GLX station. Therefore, the adjusted 2,100 VTPD in the 3.5 acre, D2 Block and adjusted 9,770 VTPD in the 15.7 acre area as it relates to drop offs to the Union Square GLX station does not mitigate the Big Dig as falsely promised. In addition, the DOT has encouraged that a sidewalk be widened to increase pedestrian accessibility to the Union Square GLX station as the proposed project is integrated with and to the GLX.

The DOT leaves the traffic operations to the city that owns the roadways and encourages them to coordinate with city officials, which in the case of Somerville is a problem. Nonetheless, the traffic impacts to the area that includes the Union Square GLX are significant and must be properly studied and not glossed over.

If every time significant bad air quality is added to the environment increasing it beyond high levels that are already in the area, it is certified by a promise to mitigate it somewhere else that in addition adds more bad air quality to the high levels that are already there, it is like a Ponzi scheme of false mitigation. Pushing the promise to mitigate down the road without ever getting the actual mitigation result. This ENF does not provide any mitigation to the Big Dig, but rather adds significant Pollution that is significantly bad for the environment and human health.

12. Comments on Comments:

a. Department of Energy Resources

The Department of Energy Resources (DER) commented essentially that the large 24-27 story tower buildings and the other building(s) totaling 400,000 sq. ft. in the residential tower buildings and another building(s) and 200,000 in office space on the 3.5 acre D2 Block per the requested Phase 1 Waiver, are subject to producing greenhouse gas emissions regarding buildings. They recommend something called Passive House for Multi Family. Calling two tower buildings full of hundreds of residential units a "multi family" is a stretch, but DER states that the Passive House approach could reduce emissions and be more affordable for residents, etc., but this does little to offset the overall enormous increase in Pollution resulting from the enormity in size, density, and number of units of the proposed buildings regarding this application.

The DER noted that the Proponent is taking reductions in emissions on paper that are dependent upon filling their proposed office space with proposed laboratory use and that the Proponent's proposed numbers would not be realized if the laboratory use did not materialize. This substantiates the gloss over ENF application with numbers flying about that cannot be substantiated, and are easily substituted later, or for which there is no consequence if their predictions fail, but great consequence to the people who live here. If there is less laboratory use than proposed, it will increasing greenhouse gas emissions for an already large increase. These predications numbers cannot be relied upon. In addition, other numbers on the MEPA application that are likely less than accurate, are still too large to certify for the environment and public health, such as VTPD, sewer calculations, etc.

b. Department of Environmental Protection

I fully support a request by the Department of Environmental Protection (DEP) for a full air quality analysis to determine the proposed increase Pollution relative to the enormity of the buildings, VTPD, and the other SCM.2

environmental impacts to the air and how the added air pollution affects the environment at large and public health. Ex. 11.

c. The DEP should request a significant study and report on the traffic impacts causing the particulate matter and other Pollution as this proposed development will literally be blowing significant amounts of particulate matter around Union Square due to a significant increase in VTPD and the enormity of the development.

13. Lack of Public Involvement

In addition to an inadequate presentation and discussion of environmental impacts at the MEPA meeting of a proposed significant project, follow up email requests for information regarding environmental impacts were ignored.

a) Engineer Frank Holmes, Stantec, Inc.

On August 3, 2018, 2:04 p.m., I requested the following from Engineer Frank Holmes, who spoke on behalf of the developer at the August 2, 2018 MEPA meeting, but have not received an answer to date. SCM.3

Re: Somerville Union Square MEPA

murrowc<murrowc@comcast.net>
8/3/2018 2:04 PM
To frank.holmes@stantec.com

Stantec
Engineer For Union Square Station Associates, LLC for MEPA application

Dear Frank Holmes,

At last night's MEPA meeting in Somerville on August 2, 2018, you said you had not assessed the entire route of the sewage from the proposed development D2 Block site regarding the Union Square Station Associates, LLC's MEPA, and or their entities', application, as to where it will travel. When will you do so? Where will you provide this information?

In addition, you said there would be 45,000 gallons per day of newly generated sewer due to the proposed project on the D2 Block and that Union Square Station Associates, LLC was paying $1 million dollars for the 4:1 Infiltration Inflow. I request that you provide the agreement for this.

You said that 4 times the leaking pipes would be fixed. How much in terms of length of pipes is that? What streets are scheduled to be repaired, and what is the cost of the repair?

Please provide any and all relevant information regarding the effect that the Miller's River under Union Square will have on the proposed site.

Please do not add my email address to lists and do not copy me ad museum or to people I do not know, as I try to avoid junk mail.

Sincerely,
Claudia Murrow

b) MEPA Director Deirdre Buckley

I left a voice mail for Director of MEPA Deirdre Buckley on August 3, 2018, and we spoke on the telephone on August 6, 2018. I asked Ms. Buckley if she had the 498 page document regarding the Union Square EEA# 15889, and she said she did not, and I offered to send her the "Sharefile link" to it that was sent to me, and she requested that I send it, which I did.

On August 6, 2018 at 1:23 PM murrowc <murrowc@comcast.net> wrote:

Mass Environmental Planning Act
617-626-1044
Dear Director Deirdre Buckley,
Forwarded is the link to the MEPA Application that was sent to me.
Sincerely,
Claudia Murrow

---------- Original Message ----------
From: Corinne Snowdon <CSnowdon@epsilonassociates.com>
To: murrowc@comcast.net
Date: July 13, 2018 at 5:14 PM
Subject: Union Square ENF EEA# 15889

Dear Interested Party,

Please use the provided Sharefile link to be able to download a PDF of the ENF and it's attachments for Union Square EEA# 15889.

https://epsilon.sharefile.com/d-s561b7f4ffc54b61a

If I can be of further assistance please do not hesitate to contact me.
Have a wonderful evening,
Corinne

Corinne A. Snowdon | Production Coordinator
Epsilon Associates, Inc.
3 Mill & Main Place, Suite 250
Maynard, Massachusetts 01754
978.897.7100 | 978.461.6239 (direct)
csnowdon@epsilonassociates.com | www.epsilonassociates.com

c) On August 6, 2018, I explained to Ms. Buckley that the MEPA meeting did not adequately discuss the environmental impacts to the surrounding area that I live in and that the 498 page document was cumbersome for me as a layperson to read, and I asked her if we could have another meeting that would give more information regarding environmental impacts, and she said that was possible, and she asked me to request it in an email, which I did, but she has not responded to date.

Re: Union Square ENF EEA# 15889

murrowc<murrowc@comcast.net>
8/6/2018 2:19 PM
To deirdre.buckley@state.ma.us

Mass Environmental Planning Act
617-626-1044
Dear Director Deirdre Buckley,

Per our conversation today, August 6, 2018, you said that if I request a meeting(s) for lay people that are interested in understanding the MEPA Application for the Union Square Development that you could provide it. Therefore, since the MEPA meeting on August 2, 2018 provided inadequate information regarding the significant environmental impacts of the proposed project, I request such a meeting(s).

Sincerely,
Claudia Murrow

d) **Somervision**[11] at no time contemplated adding 9,770 adjusted VTPD to Union Square. I went to some Somervision meetings, and tables of people, not all Somerville residents, were asked to write if they wanted diverse people to come together and live in harmony, and "surprisingly" people wrote yes. And, whether they wanted less cars and less pollution, etc., and people wrote yes. However, the very people that wrote they wanted to live here have been and are being pushed out, and the air

[11] https://www.somervillema.gov/sites/default/files/legacy/Somervision_0.pdf

quality is getting worse and in this way, the Proponent's MEPA application violates Somervision.

Public involvement on the ENF Union Square Redevelopment, pg. ES-2 - ES-6 looks good on paper, but after having attended a sampling of these meetings and hearings, little to no public input is incorporated into the final predetermined plans. In addition, public benefit meetings went on for at least 4 years ad nauseum, but there are NO enforceable public benefits, just a promise for the Master Developer to "come to the table" and a chance for more a neighborhood counsel to go to more meetings ad naeuseum.

There is no legitimate financial data stating the Master Developer qualifies to take on this project and whether this project will reduce the tax burden to the rank and file citizen as promised and promised as there is too much residential property in Somrville to begin with in the most densely populated city in New England to begin with and no need to add any more. The inordinate amount of residential units proposed will bring in less tax revenues than it costs in fire, police, schools, etc. The deficit is and will be spread to all the taxpayers and the residential tax rate has gone up not down. These and other policies are cleansing the city of residents for the benefit of the Proponent's inordinate profits who propose to levy significant environmental impacts on the environment that hurt public health with the false promise of reducing it.

The regime in Somerville has a New York City style development planned for 117 acres in Union Square that is to be built upon properties taken by eminent domain, and most of the rank and file have no idea of the magnitude of what is being planned. Despite that, there are ad nauseum lists of alleged meetings that the public barely knows about, where they are not listened to, and such meetings are held so the city and developer can say they were. Most of them are not advertised in the newspaper or subject to the Open Meeting Law. They are spoken of in a pretentious, immature way that is party like, when this is serious business negatively affecting people's lives.

> The Project and the Phase 1 Project are the product of a multi-step public process over the course of nearly ten years that was required and implemented by the City in order to ensure that community-driven planning defined the future of the City and the Union Square neighborhood. Pg. ES-4. ENF Union Square Redevelopment

The Proposed Project is City and Developer driven. The public's concerns go unaddressed. People are "voting with their feet" by leaving Somerville.

They are being replaced with a transient population. Somerville now has the largest population of 25 to 35 years per area in the Country and they pay high rents, do not stay long, and move to other cities and towns, where they can settle in for a longer time.

e) Please consider that a significant number of your comments have likely come from people that do not live in, own business in, and/or work in Somerville. The proposed development is so large that many want to get in on the financial boondoggle and/or they work for the Proponent. At the SRA meeting on April 27, 2017, there was a large contingent of people attending and clapping for the approval of the Master Land Disposition Agreement by the SRA that were not residents, business owners, or worked in Somerville. Some admitted they were from other areas. Matt Lavalee wrote the following article, Somerville Got Astroturfed on May 2, 2017 about this that is in line with what I saw.

A large group of mostly white, men within the age range of some 28 to 40, in casual business dress, jackets with open shirt collars, arrived sometime after midway through the meeting. They largely stood near the exit door to the hallway of the High School Library, though some went to where the Master Developer, Union Square Station Associates, LLC of Delaware were sitting. Some stood with legs spread and arms folded. I had not seen them at previous SRA meetings or at Board of Alderman meetings, etc., individually or as a group. I was told before the SRA meeting that emails were being sent around to people who worked for certain companies, such as architectural, design, etc., to join the group being assembled to go to the SRA meeting to "support" the developer for the benefit of their companies who they reasoned would benefit from the huge development in Union Square. They wore buttons in support of the alleged developer of Union Square and they were in favor of the SRA to vote to approve the Master Land Disposition Agreement, but I have not seen this email. After the meeting, the group left together and walked toward Highland Avenue in the direction of Union Square. Then, later I read the article Somerville Got Astroturfed, which is researched well and accurate.

As the loud, in your face, clapping from the non residents, non business owners, drowned out the vote of the SRA members, it acted as a cue for real, recognizable Somerville residents to understand that the MLDA was approved, which most residents assumed it would be. Dspite a large number of requests that it not be unless and until there were community benefits with legal recourse. In unison, Somerville residents reopened by shouting several times, "If we have to pay, we should have a say", which referred to the fact that the municipal bonds raised to pay for the

developer's infrastructure for their two 24-27 story tower buildings and other large buildings were raising residential taxes and rents in Somerville and cleansing people out for the significant financial benefit to an alleged entity on the burden of the rank and file.

However, at this SRA meeting, there was No such discussion that the Proponent would be adding significant environmental impacts, bad air quality, Pollution, and increased bad health impacts and disease to Somerville residents. The SRA said it was all roses then. One of the alleged Proponent's, Mr. Karczewski moved from Chicago to Concord, MA, regarding this proposed development, despite that he could have chosen the city with the most particulate matter in the State.

Somerville Got Astroturfed Matt Lavallee **May 2, 2017 (Ex. 14)**

https://medium.com/@strangebuttrue/somerville-got-astroturfed-991afb7870c3

14. In conclusion,

a. This is a huge project, and there was not enough iformation for the Phase 1 Waiver request for the 3.5 acre site on the D2 Block. The rest of the project proposed for the Union Square Redevelopment project had little to no information. Design and size were not discussed at the MEPA meeting and are the basis of generating more VTPD and the bad environmental impacts, and there is not enough information in either ENF. The true Proponent should file an ENF for the Union Square Redevelopment project that gives appropriate information derived from further analysis of the proposed Union Square Redevelopment project.

The Phase 1 Waiver should not be granted due to a lack of analyzation of Pollution and environmental and health impacts, and should not be separated from the larger prosed project. The numbers of added VTPD in the Phase 1 are significant and will cause damage to the environment and to health in and of itself, and the difference between that and the Union Square Redevelopment plan is more severe and they should be looked at and analyzed as one project with compounding environmental and health impacts.

However, much more information, analysis, and serious reporting, as opposed to the usual gloss over, is needed for the ENF for the 15.7 acre site to see how this will impact the health of the environment and human health to people like me who live here and others. Separating the 3.5 acre

site, would diminish the enormity of the environmental impacts to the area.

The 3.5 acres site on the D2 Block, the subject of the Phase 1 Waiver, is part of the 15.7 acre site that includes 6 more Blocks. However, this is a mere 7.5 percent of the 117 acre site of the proposed major development in Union Square on property to be taken by the SRA that will cause significant bad impacts for the environment and human health, which has not to date been properly analyzed as a whole. MEPA should take the overall environmental impacts into consideration, as separating the total development into smaller sections only obfuscates the true environmental health impacts that would increase exponentially for project as a whole

b. Another MEPA meeting should be held to go over the environmental affects earnestly, that is not a sales meeting putting forward the Proponent's "virtues" of the development that overshadows the enormity of the environmental impacts. This could and should be accomplished within some two and one half hours give or take. For this sized development with such serious consequences, more than one meeting is likely needed. It should be presented by the true Proponent entity and not by unauthorized residents unless they represent the Proponent and disclose so.

c. As a result of the huge scope of this project and the negative environmental and health impacts that it will produce, an Environmental Impact Report and a full Air Quality Analysis and additional information and analysis is needed to study the sheer increase in pollutants such as 1) particulate matter pollution, such as PM10, 2.5, etc., 2) exhaust, 3) carbon dioxide, 4) greenhouse gas emissions 5) Nitrogen Dioxide, NO2, and 6) Volatile Organic Compounds, VOC's, 7) flooding, 8) sewer impacts, 9) impervious surface, 10) over density, 11) congestion, and 12) all the environmental impacts of the enormous proposed development, including, but not limited to, the mental, social, and physical health effects and disease that would result.

Sincerely,
Sara Claudia Murrow

Exhibit 1.

Union Square Station Associates, LLC, Mass

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- Contact Us

Search the Secretary's website

Corporations Division

Business Entity Summary

ID Number: 001145075

Summary for: UNION SQUARE STATION ASSOCIATES LLC

The exact name of the Foreign Limited Liability Company (LLC): UNION SQUARE STATION ASSOCIATES LLC

Entity type: Foreign Limited Liability Company (LLC)

Identification Number: 001145075

Date of Registration in Massachusetts: 08-22-2014

Last date certain:

Organized under the laws of: State: DE **Country:** USA **on:** 07-13-2014

The location of the Principal Office:

Address: 225 N. COLUMBUS DR., STE 100

City or town, State, Zip code, Country: CHICAGO, IL 60601 USA

The location of the Massachusetts office, if any:

Address: 31 UNION STREET

City or town, State, Zip code, Country: SOMERVILLE, MA 02143 USA

The name and address of the Resident Agent:

Name: C T CORPORATION SYSTEM

Address: 155 FEDERAL ST., STE 700

City or town, State, Zip code, Country: BOSTON, MA 02110 USA

The name and business address of each Manager:

MANAGER	DAVID CARLINS	225 N. COLUMBUS DR., STE 100 CHICAGO, IL 60601 USA
MANAGER	JAMES LOEWENBERG	225 N. COLUMBUS DR., STE 100 CHICAGO, IL 60601 USA
MANAGER	RICHARD STEIN	2124 NO. LINCOLN PARK WEST CHICAGO, IL 60614 USA
MANAGER	GREG KARCZEWSKI	31 UNION STREET SOMERVILLE, MA 02143 USA

The name and business address of the person(s) authorized to execute, acknowledge, deliver, and record any recordable instrument purporting to affect an interest in real property:

REAL PROPERTY	RICHARD STEIN	2124 NO. LINCOLN PARK WEST CHICAGO, IL 60614 USA
REAL PROPERTY	DAVID CARLINS	225 N. COLUMBUS DR., STE 100 CHICAGO, IL 60601 USA
REAL PROPERTY	JAMES LOEWENBERG	225 N. COLUMBUS DR., STE 100 CHICAGO, IL 60601 USA
REAL PROPERTY	GREG KARCZEWSKI	31 NION STREET SOMERVILLE,

		MA 02143 USA

Exhibit 2.

Union Square Station Associates, LLC, Deleware
https://icis.corp.delaware.gov/Ecorp/EntitySearch/NameSearch.aspx

THIS IS NOT A STATEMENT OF GOOD STANDING

File Number:	5578280	Incorporation Date / Formation Date:	7/30/2014 (mm/dd/yyyy)
Entity Name:	UNION SQUARE STATION ASSOCIATES LLC		
Entity Kind:	Limited Liability Company	Entity Type:	General
Residency:	Domestic	State:	DELAWARE

REGISTERED AGENT INFORMATION

Name:	THE CORPORATION TRUST COMPANY		
Address:	CORPORATION TRUST CENTER 1209 ORANGE ST		
City:	WILMINGTON	County:	New Castle
State:	DE	Postal Code:	19801
Phone:	302-658-7581		

[The Certification Of Formation lists Greg Karczewski, Richard Stein, David J. Carlins, and James Lowenberg as managers with no addresses.]

Exhibit 3.

MINUTES
Thursday, June 26, 2014

The Somerville Redevelopment Authority met on Thursday, June 26th, 2014 in the Argenziano School Cafeteria at 290 Washington Street, Somerville, MA 02143

Present from the Somerville Redevelopment Authority: Nancy Busnach (Chair), Iwona Bonney (Secretary), James F. McCarthy (Treasurer), William Gage and Michael Dwyer. Also present were Eileen McGettigan as Special Counsel, and Sunayana Thomas, Economic Development Planner, OSPCD; Edward O' Donnell, Director of Economic Development, OSPCD.

Nancy Busnach, Chair, called the meeting to order at 5:35 p.m.. A quorum was present.

1. Approval of Minutes:

   Vote: Approve the June 5, 2014 minutes.

   - Motion to approve made by William Gage and seconded by Iwona Bonney.
   - Unanimously approved.

2. Motion to authorize Ed O' Donnell to execute necessary documents on behalf of the Authority for state and local historic preservation review processes for Union Square.
   - Motion to approve made by Iwona Bonney and seconded by William Gage
   - Unanimously approved.

3. Union Square
   - Nancy Busnach, Chair, provided an overview of the Union Square Due Diligence trip that took place May 27-May 30th. She mentioned that the trip was extremely impressive and aggressive. The 10-person delegation traveled to see developments at Bethesda Row in Maryland
     (Federal Realty), Lakeshore East and University Village in Chicago
     (US2), the Brewery Blocks and the South Portland Waterfront in
     Portland, OR (Gerding Edlen) and Santana Row in San Jose, CA (Federal Realty). The delegation later toured developments by The Abbey Group.

   - Nancy Busnach provided an overview of the selection process by the CAC and the staff report submitted by Wig Zamore, Co-Chair of the CAC. She explained that the process had been fair and balanced. She emphasized her appreciation for the hard work that the CAC members

     put into this selection process and recognized that the SRA members will take into consideration their finalists for the master developer.

- The SRA considered four finalists recommended by the 20-member Union Square Civic Advisory Committee (CAC): Gerding Edlen, The Abbey Group, Federal Realty/National Development and US2. US2 is a partnership between Magellan Development and Mesirow Financial. The recommendations by the CAC on the top four developers were unanimously approved by the SRA at their meeting on May 8th.
- The CAC refined their selections further by providing a report with detailed analysis prior to the meeting. After extensive discussion, the CAC members evaluated the top four master developer finalists and reached a consensus on recommending Gerding Edlen and US2.
- The Economic Development Division within the Office of Strategic Planning and Community Development also submitted a staff report to the SRA prior to the meeting recommending Gerding Edlen and US2.
- Nancy Busnach opened discussion to the board for comments and reactions to the reports that had been provided to the SRA.
- SRA member William Gage provided comments and reflections regarding each of the development projects, process, and priorities. There was a general consensus that each of the SRA members were looking for a master developer who will focus on job creation for Somerville residents, focus on professional job opportunities rather than a large focus on retail, focus on low and middle income housing, support for existing local businesses , financing, experience with traffic & infrastructure, historic preservation and capable of working with the MBTA.
- SRA members focused largely on developers' financial capability.
- Iwona Bonney identified financial stability as the most important factor for the success of a long-term project. She said an increase in daytime traffic could help local businesses thrive on a 24/7 basis.
- Jim McCarthy was concerned with a developer's ability to build and stay in Somerville -- to work with the existing businesses and residents to improve the downtown while the character of Somerville is retained.
- Mike Dwyer narrated the due diligence milestones. He was concerned about what happened to Quincy Center that was aimed to be developed employing an elaborate developer-selection-process as this one. He cautioned that the Union Square project should not have negative impacts on job generation. He raised several questions: Who is going to buy and invest in the square? Who is going to build and sell? Stabilize rent for residential and commercial? Is retail going to bring-in non-retail businesses or vice-versa?
- Nancy Busnach emphasized the need for financial strength of the developer to sustain the work in Somerville. She noted that she was particularly impressed by the financial resources of the Chicago group, as well as their innovative second mortgage program in the University Village development.
- Mr. Dwyer made a motion to go into executive session to discuss the developer candidates. Ms. McGettigan opined that going into executive session for this purpose was not permitted under the Open Meeting Law.

4. Selection of Master Developer
    - Motion to vote on a Master Developer for Union Square made by Michael Dwyer and seconded by Iwona Bonney.
    - Edward O' Donnell explained that the SRA and CAC have been discussing the master developer process for six months. The original list had very qúalified candidates and it was a tough vote to narrow them down to four developers. The CAC has been meeting diligently and inviting public comments throughout the process. The Mayor asked the CAC to work on the project for two years. The CAC did release their report and focused on two developers and the OSPCD report focused on the same two. It is requested that the Board respect all the public process that has been provided.
    - Unanimously voted and approved for Union Square Station Associates (US2) to be selected as the master developer for the Union Square Urban Revitalization Plan.

5. Motion to authorize Nancy Busnach to execute any necessary documents in furtherance of the vote of the master developer.
    - Motion to approve by Iwona Bonney and seconded by William Gage.
    - Unanimously approved.

6. Executive Session for the purpose of discussing litigation strategy. Ms. Busnach announced that the Board would not be reconvening in open session.

    • Iwona Bonney motioned to go into Executive Session for the purpose of discussing litigation strategy and seconded by William Gage. • Roll Call Vote:

        - James McCarthy: Aye
        - William Gage: Aye
        - Iwona Bonney: Aye
        - Michael Dwyer: Aye
        - Nancy Busnach: Aye

7. Adjournment of open session at 6:35 p.m.

Exhibit 4.

https://www.somervillema.gov/news/us2-selected-union-square-master-developer

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HomeNewsUS2 SELECTED AS UNION SQUARE MASTER DEVELOPER

US2 SELECTED AS UNION SQUARE MASTER DEVELOPER

Thursday, June 26, 2014

US2 SELECTED AS UNION SQUARE MASTER DEVELOPER

Next steps: 100-day plan for community outreach, development of community process to shape community benefits and standards for redevelopment

SOMERVILLE – Union Square Station Associates (US2) was unanimously selected by the Somerville Redevelopment Authority (SRA) as the master developer for the **Union Square revitalization** plan at the SRA's meeting on Thursday, June 26.

US2 is a partnership between Magellan Development and Mesirow Financial. Magellan previously developed Lakeshore East and University Village, both in Chicago. The SRA considered three other finalists recommended by the 20-member Union Square Civic Advisory Committee (CAC): Gerding Edlen, The Abbey Group, and the team of Federal Realty and National Development.

In December 2013, the SRA issued a **Request for Qualifications** (RFQ) for a master developer partner that will work with the City, SRA, CAC, current property owners and community members to design and implement the redevelopment of the seven development blocks identified in the state-approved Union Square Revitalization Plan. Ten firms applied before the list was narrowed down to the four finalists after several meetings of the CAC and presentations by each firm to the SRA. A 10-person delegation consisting of CAC and SRA members, City staff and elected officials **visited projects completed by the four finalists** in May and June, and at a June 23 meeting, **the CAC** and **a report by the Mayor's Office of Planning and Community Development** (OSPCD) recommended US2 and Gerding Edlen as their final recommendations to the SRA.

US2 qualifications cited by the CAC and OSPCD included the team's on-the-ground engagement in the community from the start of the process, plans to expand Somerville's innovation economy through the Union Square redevelopment, and creative approach toward creating affordable housing in their developments.

"I am pleased that a thorough community process has led to the SRA's selection of US2 as our partner in achieving the goals that the community charged us with in **SomerVision**—creating new jobs, public green space and homes with a range of affordability in Union Square through sustainable development, while preserving the history and unique character of our historic commercial center and neighborhood," said Mayor Joseph A. Curtatone. "This process started with the community in SomerVision, continued with the community-driven rezoning of Union Square and Boynton Yards, and stayed community-focused throughout this process. I expect US2 to continue this proven approach by working closely with the CAC to ensure that the community's vision for this neighborhood is fully realized."

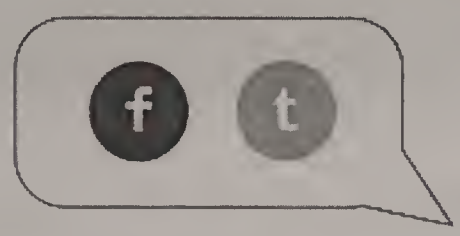
Next steps include US2's creation of a 100-day plan, beginning with the establishment of a local office in Somerville and focusing on conversations with the community to gain a deeper understanding of local priorities. US2 will attend the next CAC meeting and immediately expand their previous outreach efforts to Union Square residents, businesses and community stakeholders, and will work with the City in the coming weeks to create a social event and formally introduce themselves as the City's partner. The City is working on establishing a clear community process that will shape a community benefits and mitigation package for the project, and the standards and conditions for Union Square's redevelopment that, in turn, will shape the neighborhood's development. The development team will also establish contact with the MBTA regarding the Green Line Station design, and Parsons Brinkerhoff regarding the in-depth roadway and infrastructure improvement plan for the square.

The CAC will act as a sounding board for US2 going forward, helping shape proposals that will then be brought forward for full public review, providing the community a dialogue with the

developer to help determine a strategy that ensures the continuity of this unique and vibrant square, while making sure all the pieces come together in a way that creates community-driven, sustainable and strategic economic development.

The RFQ's criteria for selecting a Union Square master developer included formulating a community benefits and mitigation package for large-scale, mixed-use developments; experience with pedestrian- and bike-friendly transit-oriented developments; financial capacity to complete the project; conducting public charrette planning sessions; and creating a sense of community and place including embracing existing eclectic elements that define an area.

We'd love to hear what you think.



Feedback

Please submit website feedback using this form. Be sure to include:

- A description of the issue (if any)
- A link to the affected pages

Thank you for your feedback!

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- Jobs
- Contact Us
- Accessibility
- Disclaimer
- Press Contacts

Exhibit 5.

https://www.ilsos.gov/corporatellc/CorporateLlcController

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JESSE WHITE
SECRETARY OF STATE

LLC FILE DETAIL REPORT

File Number	04685989		
Entity Name	RAS UNION SQUARE DEVELOPMENT LLC		
Status	ACTIVE	On	05/14/2018
Entity Type	LLC	Type of LLC	Domestic
File Date	05/12/2014	Jurisdiction	IL
Agent Name	ADAM J. GRAIS	Agent Change Date	05/12/2014
Agent Street Address	30 N. LASALLE ST., STE 3000	Principal Office	225 N COLUMBUS DR STE 100 CHICAGO, IL 606010000
Agent City	CHICAGO	Managers	View [LLC Managers below]
Agent Zip	60602	Duration	PERPETUAL
Annual Report Filing Date	05/14/2018	For Year	2018
Series Name	NOT AUTHORIZED TO ESTABLISH SERIES		

LLC MANAGERS

Entity Name	RAS UNION SQUARE DEVELOPMENT LLC	File Number	04685989

Name	Address
RAS DEVELOPMENT LLC	225 N. COLUMBUS DR., STE 100, CHICAGO, IL - 606010000

Exhibit 6.

https://www.ilsos.gov/corporatellc/CorporateLl

OFFICE OF THE ILLINOIS SECRETARY OF STATE

JESSE WHITE
SECRETARY OF STATE

LLC FILE DETAIL REPORT

File Number	04901932		
Entity Name	MAGELLAN US2 LLC		
Status	ACTIVE	On	07/24/2018
Entity Type	LLC	Type of LLC	Domestic
File Date	08/04/2014	Jurisdiction	IL
Agent Name	KIMBERLY J SHARON	Agent Change Date	08/04/2014
Agent Street Address	225 N COLUMBUS DR STE 100	Principal Office	225 N COLUMBUS DR STE 100 CHICAGO, IL 606010000
Agent City	CHICAGO	Managers	View
Agent Zip	60601	Duration	PERPETUAL
Annual Report Filing Date	07/24/2018	For Year	2018
Series Name	NOT AUTHORIZED TO ESTABLISH SERIES		

https://www.ilsos.gov/corporatellc/CorporateLlcController?command=mms&fileNbr=04901932&type=MGR

OFFICE OF THE ILLINOIS SECRETARY OF STATE

JESSE WHITE
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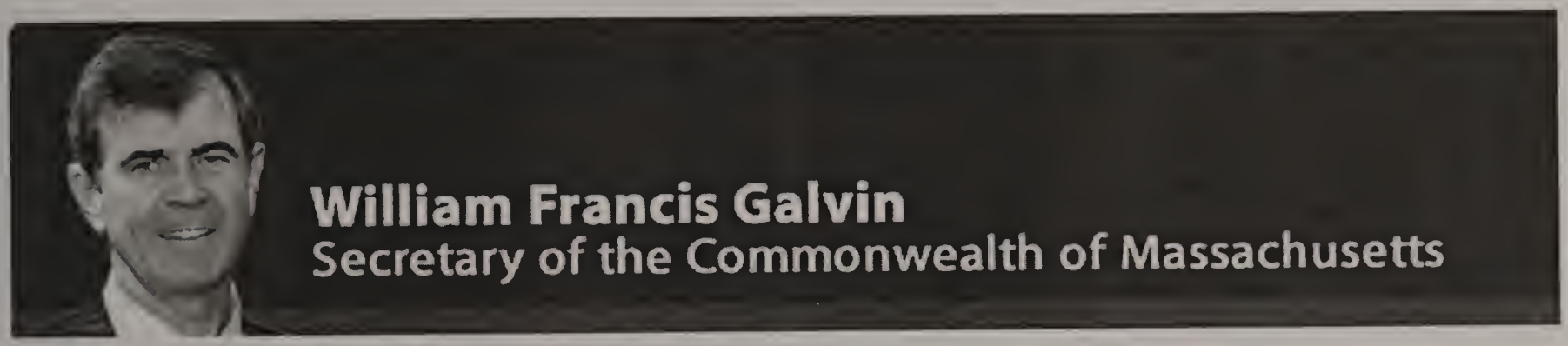
LLC MANAGERS

Entity Name	MAGELLAN US2 LLC	File Number	04901932

Name	Address
CARLINS, JOEL	225 N COLUMBUS DR STE 100, CHICAGO, IL - 60601
CARLINS, DAVID	225 N COLUMBUS DR STE 100, CHICAGO, IL - 60601
LOEWENBERG, JAMES	225 N COLUMBUS DR STE 100, CHICAGO, IL - 60601
BERGER, ROBIN	225 N COLUMBUS DR STE 100, CHICAGO, IL - 606010000

Exhibit 7.



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Corporations Division

Business Entity Summary

ID Number: 001317827

Summary for: UNION SQUARE RELP MASTER DEVELOPER LLC

The exact name of the Foreign Limited Liability Company (LLC): UNION SQUARE RELP MASTER DEVELOPER LLC

Entity type: Foreign Limited Liability Company (LLC)

Identification Number: 001317827

Date of Registration in Massachusetts: 03-15-2018

Last date certain:

Organized under the laws of: State: DE **Country:** USA **on:** 03-05-2018

The location of the Principal Office:

Address: 31 UNION SQUARE C/O UNION SQUARE STATION ASSOCIATES LLC

City or town, State, Zip code, Country: SOMERVILLE, MA 02143 USA

The location of the Massachusetts office, if any:

Address: 31 UNION SQUARE C/O UNION SQUARE STATION ASSOCIATES LLC

City or town, State, Zip code, Country: SOMERVILLE, MA 02143 USA

The name and address of the Resident Agent:

Name: C T CORPORATION SYSTEM

Address: 155 FEDERAL ST., SUITE 700

City or town, State, Zip code, Country: BOSTON, MA 02110 USA

The name and business address of each Manager:

The name and business address of the person(s) authorized to execute, acknowledge, deliver, and record any recordable instrument purporting to affect an interest in real property:

REAL PROPERTY	GREG KARCZEWSKI	31 UNION SQUARE SOMERVILLE, MA 02143 USA
REAL PROPERTY	DAVID CARLINS	225 N. COLUMBUS DR., SUITE 100 CHICAGO, IL 60601 USA
REAL PROPERTY	JAMES LOEWENBERG	225 N. COLUMBUS DR., SUITE 100 CHICAGO, IL 60601 USA
REAL PROPERTY	RICHARD STEIN	225 N. COLUMBUS DR., SUITE 100 CHICAGO, IL 60601 USA
REAL PROPERTY	HAILEY GHALIB	9830 COLUMBNADE BLVD., SUITE 600 SAN ANTONIO, TX 78230 USA
REAL PROPERTY	JAMES K. HARDIN	9830 COLUMBNADE BLVD., SUITE 600 SAN ANTONIO, TX 78230 USA

Exhibit 8.

PUBLIC NOTICE OF ENVIRONMENTAL REVIEW

PROJECT: Union Square Redevelopment

LOCATION: Union Square, Somerville, Massachusetts

PROPONENT: Union Square RELP Master Developer LLC and Somerville Redevelopment Authority

The undersigned is submitting an Environmental Notification Form ("ENF") to the Secretary of Energy & Environmental Affairs on or before July 2, 2018

This will initiate review of the above project pursuant to the Massachusetts Environmental Policy Act ("MEPA", M.G.L. c. 30, s.s. 61-62l). Copies of the ENF may be obtained from:
Epsilon Associates,
Inc. 3 Mill & Main Place, Suite 250, Maynard, MA 01754
978-897-7100

Copies of the ENF are also being sent to the Conservation Commission and Planning Board of Somerville where they may be inspected.

The Secretary of Energy & Environmental Affairs will publish notice of the ENF in the Environmental Monitor, will receive public comments on the project for 20 days, and will then decide, within ten days, if an Environmental Impact Report is needed. A site visit and consultation session on the project may also be scheduled. All persons wishing to comment on the project, or to be notified of a site visit or consultation session, should write to the Secretary of Energy & Environmental Affairs, 100 Cambridge St., Suite 900, Boston, Massachusetts 02114, Attention: MEPA Office, referencing the above project.

By Union Square RELP Master Developer LLC and Somerville Redevelopment Authority

7/4/18 The Somerville Times

Exhibit 9.

1) On July 13, 2018 at 4:41 PM Strysky, Alexander (ENV) wrote:

Hi Claudia- I wanted to follow up on our phone conversation earlier today. The Proponent has requested an extension of the comment period. Comments will be accepted until August 24. The consultation session/public meeting will be held on August 2 at 6:00 PM at Workbar, 31 Union Square. There will be a brief walk around at the D2 site, 26 Prospect Street, at 5:30. The Environmental Monitor will be updated with this information on Monday. Please let me know if you have any questions.

Alex

Alex Strysky
MEPA Office
100 Cambridge Street, 9th Floor
Boston, MA 02114
ph: (617) 626-1025
fx: (617) 626-1181

2) **From:** murrowc [mailto:murrowc@comcast.net]
Sent: Monday, July 16, 2018 7:48 AM
To: Strysky, Alexander (EEA)
Subject: Re: Union Square

MEPA Office

Dear Alexander Strysky,

Workbar at 31 Union Square is a private property that partners with the applicant of the MEPA application, Union Square Station Associates, LLC, also known as US2 and their related entities, for the last two years or so, which US2 has used as their work site and local headquarters, and is a not a neutral place. The front door of Workbar at 31 Union Square says in white lettering on glass, "WorkBar Hosted by US2". The following article describes the partnership between Workbar and US2 at the following link to Workbar and US2's website.

US2 And Workbar Announce Partnership To Offer Shared Coworking Space (See copy attached)

https://www.workbar.com/posts/us2-and-workbar-announce-partnership-to-offer-shared-coworking-space

By choosing this location, you are intentionally intimidating persons who are not necessarily supportive of US2's Union Square MEPA application and its enormous burden, financially, environmentally, historically, and in many other ways, on the rank and file residents. Meeting on US2's turf and not on neutral ground presents a conflict of interest. Do you and your office work for the developer's interests? There are other public spaces available that are owned by the city near Union Square that you could have the meeting at, including, but not limited to 1) The Police Headquarters at 220 Washington St, that has a room used for public meetings and 2) the Argenziano School, 290 Washington St has space in the cafeteria used for public meetings (this site has parking).

3) RE: Union Square

Strysky, Alexander (ENV)<alexander.strysky@state.ma.us>
7/16/2018 1:32 PM
To murrowc

Thanks for your input, Claudia. The meeting will be held in a different location. The place, time and date will be posted in the Environmental Monitor as soon as it is scheduled.

Alex

Alex Strysky
MEPA Office
100 Cambridge Street, 9th Floor
Boston, MA 02114
ph: (617) 626-1025
fx: (617) 626-1181

Exhibit 10.

On July 17, 2018 at 10:17 AM Strysky, Alexander (ENV) wrote:

Alex Strysky
MEPA Office
100 Cambridge Street, 9th Floor
Boston, MA 02114
ph: (617) 626-1025
fx: (617) 626-1181

From: Strysky, Alexander (EEA)
Sent: Tuesday, July 17, 2018 10:16 AM
To: Alison Verkade (alison.verkade@noaa.gov); 'avorce@nantucket-ma.gov'; Backman, Andy (DCR); Ballam, John (ENE); Barbara Newman; Boeri, Robert (EEA); Buckley, Deirdre (EEA); 'bwoods@nmcog.org'; Carr, Jillian (FWE); Central Massachusetts Regional Planning Commission; Cheeseman, Melany (FWE); 'Christopher.Boelke@Noaa.gov'; 'Ciaramella, Pasquale'; Dalzell, Stewart; Deanna Moran; 'Dorr Fox (dfox@capecodcommission.org)'; 'Elizabeth Perry'; Engler, Lisa Berry (EEA); 'Eric.Hutchins@aa.gov'; Evans, Tay (FWE); Ferguson, Jana (DPH); Flaherty, Erin (EEA); Fragata, Carlos (DEP); French, Tom (FWE); Galvin, Mike (DCR); Glenn, Kathryn (EEA); Haney, Rebecca (EEA); Hill, David (DEP); Hobill, Jonathan (DEP); Hopson, Barbara (AGR); Huckery, Pat (FWE); Janik, David (DEP); 'Jill Valdes Horwood'; Johnson, Holly (DEP); Jonathon Idman (jidman@capecodcommission.org); Kate Frew (kate.frew@state.ma.us); Kerigan, Kathleen (DEP); 'Kilmer, Charles'; 'Kinahan, Erin (DOT)'; Kirby, Christine (DEP); 'Laney, Kristen'; LaRosa, Thomas (DCR); 'Lauren Glorioso'; Lehan, Richard (FWE); 'lindad@frcog.org'; Logan, John (FWE); 'Lorion, Barry (DOT)'; 'Lucien, Lionel (DOT)'; Lynch, Ben (DEP); Mahala, Jim (DEP); Marold, Misty-Anne (FWE); Mastone, Victor (EEA); 'maura.zlody@ci.boston.ma.us'; McKenna, Steve (EEA); Mike R Johnson - NOAA Federal; 'mpillsbury@mapc.org'; Mystic River Watershed Association (patrick@mysticriver.org); 'NKarns@berkshireplanning.org'; Padula, Michele (AGR); Petitpas, Christian (FWE); 'Pioneer Valley Planning Commission'; Potti, Pooja (FWE); Putnam, Nancy (DCR); Regosin, Jonathan (FWE); 'Reiner.Ed@epamail.epa.gov'; Ronald Hall; Ronan, Katherine; Salomaa, William (DCR); 'Sandy Conaty'; Schluter, Eve (EEA); 'Shattuck, Lori (DOT)'; Simon, Brona (SEC); Singleton, Stolle (EEA); Skiba, Catherine (DEP); Stanley, Laura (DEP); Strysky, Alexander (EEA); Sullivan, Jan (DPH); Tamul, Stella (DEP); 'Taylor, Jo-Ann'; 'timmerman.timothy@epa.gov'; Tipton, Nathaniel (DCR); 'Van Deusen, Margaret'; Veinotte, Amanda (FWE); Viola, John D. (DEP); Warncke, Tracy (EEA); 'Winn, Jane'; Wixon, Josephine (EEA); Worrall, Eric (DEP); Zoto, George (DEP)
Cc: Geoff Starsiak (gstarsiak@epsilonassociates.com); 'mayor@somervillema.gov'; 'planning@somervillema.gov'; 'ospcd@somervillema.gov'; 'health_webcontact@somervillema.gov'; 'vboukili@somervillema.gov'; 'tgalligani@somervillema.gov'; Wig Zamore (wigzamore@gmail.com)
Subject: Notice of MEPA Consultation Session and Comment Period Extension- EEA 15889, Union Square Redevelopment, Somerville

NOTICE OF MEPA CONSULTATION SESSION and COMMENT PERIOD EXTENSION

EEA No. 15889 Union Square Redevelopment, Somerville

Project Description: An Expanded Environmental Notification Form (EENF) has been filed with the Executive Office of Energy and Environmental Affairs (EEA) by Union

Square RELP Master Developer LLC (US2) and the Somerville Redevelopment Authority to construct a mixed-use development of approximately 2.4 million square feet (sf) in seven development parcels. The development program includes 1.15 million sf of office /lab space, 140,000 sf of retail space, a 93,000-sf hotel, 74,000 sf of arts/creative space and 933,000 sf (up to 998 units) of residential units, including 183-213 affordable units. The project will include 1,500 parking spaces, landscaped open space and bicycle and pedestrian facilities. The project site covers 15.7 acres and will increase impervious area by 1.15 acres. It will generate 23,239 average daily trip, use 143,417 gallons per day (gpd) of water, and generate 143,417 gpd of wastewater. The maximum building height will be 285 feet.

The project exceeds the following thresholds for a mandatory Environmental Impact Report (EIR): 301 CMR 11.03(6)(a)(6), generation of 3,000 or more average daily trips on roadways providing access to a single location and 301 CMR 11.03(6)(a)(7), construction of 1,000 or more new parking spaces at a single location. The project is located on landlocked filled tidelands and will require a Public Benefits Determination. It is subject to the MEPA Greenhouse Gas Emissions Policy. The project involves one or more land transfers from the Somerville Redevelopment Authority and permits from the Massachusetts Department of Environmental Protection, the Massachusetts Water Resources Authority and review by the Massachusetts Historical Commission

The Proponent has filed an Expanded Environmental Notification Form (EENF) with a request for a Phase 1 Waiver that would allow for the construction of Phase 1 to commence prior to completion of MEPA review of the entire project. Phase 1 involves development of the 3.5 acre D2 block and includes a total of 607,000 sf of development with 166,000 sf of office/lab space, 29,000 sf of retail space, 450 residential units (including 90 affordable units), 290 parking spaces and access facilities for the MBTA's planned Union Square Station. Phase 1 will add 1.83 acres of impervious area, generate 4,992 average daily trips, use 45,515 gpd of water, and generate 45,515 gpd of wastewater.

The Proponent's request for an extension of the comment period has been granted by the Secretary of EEA. The deadline for comments and the schedule for the issuance of a Certificate listed below incorporate the comment period extension.

A MEPA public consultation session will be held to receive advice and comments from agencies, officials, and citizens regarding which environmental issues, if any, are significant for this project. Opinions as to the extent and significance of possible environmental impact and the merits of the proponent's Phase 1 waiver request will be welcome.

The meeting will be held on: Thursday, August 2, 2018 at 5:30 PM at the Public Safety Building, 220 Washington St. A site walk of the Phase 1 site (26 Prospect Street) will be held at 5:00 PM.

MEPA comments due on or before: August 24, 2018

Certificate due: August 31, 2018
Contact for project information: Geoff Starsiak, (978) 897-7100, gstarsiak@epsilonassociates.com
MEPA contact: Alex Strysky, (617) 626-1025, alexander.strysky@mass.gov

Alex Strysky
MEPA Office
100 Cambridge Street, 9th Floor
Boston, MA 02114
ph: (617) 626-1025
fx: (617) 626-1181

Alex Strysky
MEPA Office
100 Cambridge Street, 9th Floor
Boston, MA 02114
ph: (617) 626-1025
fx: (617) 626-1181

Exhibit 11.

https://19january2017snapshot.epa.gov/brownfields/massachusetts-brownfields-funding-history_.html

Somerville

Recipient	Grant Number	Grant Type	Amount	Funding Type	Year Awarded	Status
	TBA	Targeted Brownfields Assessment of 228 Washington Street	$50,000	Hazardous Substances		Closed
	V99186901	Assessment	$100,000	Hazardous Substances	1996	Closed
			$100,000		1998	
			$150,000		2002	
			$500,000	Hazardous Substances	1999	
	BF98193901	**Revolving Loan Fund**	**$400,000**	**Hazardous Substances**	**2010**	Active
			$450,000	**Hazardous Substances**	**2012**	
			$300,000	**Hazardous Substances**	**2015**	
City of Somerville	BF98194801	Cleanup of 30 Allen Street	$200,000	Hazardous Substances	2003	Closed
	BF97133401	Assessment	$200,000	Hazardous Substances	2005	Closed
	BF97186101	Cleanup of Community Path Park, Phase 1, 112A Central Street	$200,000	Hazardous Substances	2007	Closed
	BF96133901	**Assessment**	**$200,000**	**Hazardous Substances**	**2010**	**Closed**
	BF96154001	**Cleanup of Kiley Barrel, Parcels 82-D-3, 34A & 37**	**$600,000**	**Hazardous Substances**	**2011**	**Closed**
	BF96168401	**Cleanup of Kiley Barrel,**	**$200,000**	**Hazardous Substances**	**2012**	**Active**

Somerville

Recipient	Grant Number	Grant Type	Amount	Funding Type	Year Awarded	Status
		Parcel 82-D-2, 264-266 Somerville Ave				
		Cleanup of Kiley Barrel, Parcel 82-D-4, 10 Milk Place	$200,000	Hazardous Substances		
		Cleanup of Kiley Barrel, Parcel 82-D-36, 8 Bennett Street	$200,000	Hazardous Substances		
	BF96190801	Assessment	$200,000	Hazardous Substances	2014	Active
			$200,000	Petroleum		
		Total	$4,450,000			

Exhibit 12.

https://www.usnews.com/news/healthiest-communities/articles/2018-04-10/better-air-means-better-health-in-somerville-massachusetts

Healthiest Communities

Fighting for Breath in Near-Highway Neighborhoods

A Massachusetts city is working to reduce pollution exposure in communities where its threats loom large.

By Gaby Galvin Staff WriterApril 10, 2018, at 6:00 a.m.

Fighting for Breath in Massachusetts

More

Infamous for its congested roads and rush-hour backups, traffic on I-93 creates significant air-quality and health challenges for residents living near the highway in Somerville, Mass.(Jim Davis/The Boston Globe/Getty Images)

In the neighborhoods straddling Interstate 93 in Somerville, Massachusetts, residents know to keep their windows shut each weekday as commuters travel from Boston's suburbs into the city, their cars spouting exhaust and other pollution that collects as soot on the sides of houses.

Infamous for its congested roads and rush-hour backups, traffic on I-93 creates significant air-quality and health challenges for residents living near the highway, many of whom are low-income and are more likely to get sick from the pollution exposure, but often can't afford to move or protect their homes from the unnatural elements.

Funding problems, older housing and the city's density – Somerville occupies just 4.1 square miles of land, but is home to roughly 81,000 people – have forced leaders to be creative when confronting the area's air issues, which will be prevalent "as long as vehicles have tailpipe emissions," says George Proakis, the city's planning director.

"We are very focused on being a more walkable and bikeable community, but the transportation infrastructure that takes people from the suburbs north of us into Boston every day is going to continue to speed right through the middle of our city," Proakis says. "We have to take a really close look at how that impacts the health and well-being of our residents."

Urban areas typically have poorer air quality than rural regions, and residents living near highways and other avenues of pollution may be at greater risk of asthma and impaired lung development, as well as cardiovascular disease and cancer. While study results are mixed, research has indicated people of color and those of lower socioeconomic status are at greater risk of health issues stemming from air pollution.

In Somerville, where about 70 percent of the population is non-Hispanic white and the median household income is $78,673, residents of the East Somerville, Ten Hills and Winter Hill neighborhoods surrounding I-93 bear the brunt of the issue. While these areas have become increasingly gentrified in recent years, Proakis says they still house significant low-income populations.

"It's kind of the chicken-or-the-egg thing," says Patricia Fabian, a research assistant professor of environmental health at Boston University who led a study published in November on social disparities in air pollution exposure across the state. "Nobody wants to live that close to the highway, so the real estate price is lower and low-income groups move there, or minorities or more disadvantaged populations [move there]."

RELATED CONTENT

For a Healthy County, It Takes a Village

While Somerville's problems are serious, they aren't uncommon, according to a U.S. News analysis of the nation's Healthiest Communities. But in Middlesex County, where Somerville falls, the racial disparity in exposure to air toxics is about seven times worse than the national median, and the probability of contracting cancer from exposure to air toxics is higher there than in the rest of the state or country.

Still, with its decadeslong effort to mitigate air pollution exposure, particularly in the hardest-hit neighborhoods, Somerville may serve as a model for other communities looking to do the same.

One collaboration among Tufts University, the Somerville Transportation Equity Partnership and other community partners seeks to build research and influence local policy and planning decisions in Somerville and Boston's Chinatown neighborhood.

Members of the coalition convinced Somerville officials to move a park about 200 meters away from the highway rather than renovate it in 2013, and pushed for the construction of a new subway stop to reduce car traffic in the city in 2014, says Ellin Reisner, president of the Somerville Transportation Equity Partnership.

Reisner also works with developers to ensure new houses built near I-93 have good air filtration systems, and hopes to secure grant funding to test air quality in older housing, "which we have a lot of in Somerville," she says. She's also studying the potential impacts of other interventions that could help reduce toxics exposure in older housing, including air conditioning and triple-paned windows.

"In very cold weather, early in the day, morning rush hour is when the exposure is the worst," Reisner says. "So we're thinking about whether it would it make more sense to put better filtration in homes, or put insulation in some of these older homes. ... There are lots of things that can help, but they're expensive and there isn't a lot of money out there to pay for it, so that's a challenge."

Proakis agrees that air quality in older buildings remains a major issue, but says new development close to the highway actually can help by blocking some pollution from reaching houses two or three rows back, as long as the new buildings have high-quality air filtration systems of their own.

Like elsewhere, officials and activists in Somerville must balance air-quality efforts with the community's other needs. But sometimes, these kinds of initiatives can kill two birds with one stone: For example, adding designated bike lanes, which Somerville has done, promotes physical activity and reduces car pollution. About 6 percent of the city's workers bike to their jobs, while another 11.5 percent walk, according to U.S. Census estimates – far above the national and state averages.

"We have a very high number of people who are bicycle commuters and ride bikes in Somerville, despite the fact that we are an old city with small streets," Reisner says. "There's a lot of active transportation efforts going on here, but we're really worried about making sure that people don't go into areas where they're going to have the most exposure. People want to make it a more physically active environment, but at the same time, do it in a safe way."

RELATED CONTENT

Designing Healthy Communities

Efforts to curb pollution in the state overall seem to be working: Between 2003 and 2010, concentrations of nitrogen dioxide and fine particulate matter – two major forms of air pollution – decreased across Massachusetts, although Fabian's research showed that predominantly Hispanic and black urban communities still were exposed to air pollution at higher rates than mostly white communities. Gaps in exposure among racial and ethnic groups also increased slightly during this time frame, the study found.

"The significance is, one, this is great, we're reducing air-pollution exposure," Fabian says of the findings. "All of these regional policies around, say, putting different kinds of converters in automobiles, or trying to control emissions from power plants or industry, et cetera, are working. And I think that we now need to focus on smaller policy interventions for smaller areas."

Those smaller policy interventions still require state and federal support, proponents agree, especially in smaller communities with fewer resources.

Barry Keppard, the public health lead for the Metropolitan Area Planning Council – a regional planning agency for metropolitan Boston – says local developers have been "very cooperative" with the push to install high-level air filtration systems in new buildings, but it would help if the state allowed communities like Somerville to mandate their installation.

"It probably wouldn't be just us that would look at it at that point, but the state hasn't gotten there yet," he says. "Barriers on the highway would also help, but the cost of them is not something a small local government can handle."

In November, the Massachusetts House of Representatives approved a bill that would allocate $500,000 to reduce noise pollution along Somerville's I-93 corridor. Similar legislation in the Senate would designate $2 million for that purpose, and a conference committee was appointed in February to work out differences between the two measures.

RELATED CONTENT

How to Sell a Soda Tax

Proakis, the city planner, says sound barriers also can help trap air pollutants on the highway, which is "probably not great for someone stuck in traffic on the highway every day, but that's a shorter period of time than being a resident living in a house every day, breathing the particulate matter."

Communities across the country can learn from one another and collaborate on these types of initiatives, says Reisner, who has been closely watching efforts in California to reduce exposure to air pollution from truck traffic in port cities like Los Angeles. She also has met with officials from the neighboring Massachusetts town of Medford to share strategies on developing the area along the highway as safely as possible.

Still, proponents agree there is much more work to be done to reduce exposure in the most affected communities, both locally and across the country. In Massachusetts, Keppard hopes the state continues to support long-term initiatives that get to the root of the issue, rather than focusing on individual projects or one-off successes.

"I think the only ask is that there's continued partnership around finding what ways are really working now and what ways might work better to create environments that allow people to live their healthiest lives," Keppard says. "Both the opportunities in their lives, jobs, housing – but it also essentially means being free from exposure to traffic pollutants."

Gaby Galvin, Staff Writer

Gaby Galvin is a staff writer at U.S. News & World Report. You can follow her on Twitter and email her at ggalvin@usnews.com.

Exhibit 13.

https://www.clf.org/blog/green-line-extension-back-track/

Green Line Extension Back on Track

Nov 25, 2017 Rafael Mares | @RafaelMares2

The MBTA Green Line extension took a major step forward with the hiring of a contractor for the long-awaited project.

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CLF has been steadfast in our push for the Green Line extension (GLX), but making it a reality has been a rollercoaster ride with twists and turns that threatened to derail this critical public transportation project before it could get off the ground. However, last week, the Massachusetts Bay Transportation Authority (MBTA) took a significant step to get the Green Line extension back on track, hiring the contractors who will design and build the line.

Barely two years ago, the project was in danger of not going forward at all. At the time, proposed costs were estimated at as much as one billion dollars over projections. As a result, state Secretary of Transportation Stephanie Pollack declared that "[e]verything is on the table, and everything includes canceling the project." While MBTA officials cited many potential reasons for the increased cost estimate, we urged the agency not to give up on this vital project and suggested a more competitive bidding process.

After redesigning and simplifying parts of the Green Line extension, the agency put the project out for new bids with much better results. The MBTA picked a contractor whose bid not only came in under the agency's revised budget, but also allowed important components to be added back in that were originally eliminated to cut costs. These include additional elevators, public art, platform canopies, an enhanced vehicle maintenance facility, and an additional connection to and the construction of a full community path. Construction of the full community path along with the Green Line Extension was one of CLF's top priorities for this bidding process.

What's more, if nothing else goes wrong going forward, there is enough money left over to reinstate the funding previously set aside to extend to Route 16 in Medford, which has always been a major priority in CLF's advocacy for the project.

Ultimately, moving forward the Green Line extension is good news for our economy, our climate, and our communities. Increased and equitable access to public transit makes it easier for us all to get to jobs and to school, helps us opt out of driving, and improves air quality all around. CLF has worked for more than a decade to see this project through, and we look forward to celebrating with our friends, neighbors, and partners when that first Green Line train pulls into one of the new Somerville and Medford stations.

Exhibit 14.

Matt Lavallee
May 2, 2017

Somerville Got Astroturfed

Somerville, Massachusetts last Thursday.

On Thursday, 27 April, I attended a public meeting of the Somerville Redevelopment Authority (SRA) at the High School library. The SRA voted to pass the Union Square Master Land Disposition Agreement (MLDA), transferring 12 acres of property to US2, the master developer of the Union Square project. The SRA, an un-elected body appointed by the Mayor, voted to approve the transfer, despite objections raised by community groups regarding accountability on the part of US2.

The result of this vote is a disappointment, but not a surprise. Another turn of events that evening was very shocking: our city government meeting was "astroturfed"—attended by a large group of non-Somervillens expressing support for the developer's agenda. Several pro-developer attendees claimed outright that they were not Somerville residents. One asked me where the Seventh Ward is when I told him I live here. The person handing out signs and stickers to the dozens of pro-developer attendees—a Malden resident—is an associate at The Novus Group, a firm specializing in "Disruptive lobbying for the innovation economy." Novus's other clients include DFER, a Wall Street-funded group working to privatize public schools and weaken teachers' unions, and Airbnb, a corporate middleman that profits from making rental apartments more scarce—maybe you saw Novus'recent astroturf petition to the city of Cambridge on behalf of Airbnb.

They held signs made by a paid consultant, checked their phones, and clapped tepidly when the un-elected board voted to transfer public land to a private corporation. Immediately after the vote

the astroturfers filed out together, a few dozen crossing the lawn and disappearing up Highland Avenue. Why had they come, these out-of-towners? Our guess: they were assembled by US2, to give the impression that the community supports the land transfer, when in fact multiple well-established groups spoke out against it. The MLDA specifically helps US2 avoid true accountability to our community in the form of a strong and enforceable Community Benefits Agreement.

Whether or not we support the Union Square development plan as written, Somervillens should be aware that outside groups who stand to profit from it are trying to play tricks on members of our planning board. We hope that the Mayor and Board of Aldermen are as insulted by this tactic as we are, and will publicly say so.

Matt Lavallee

Co-signed -

Daniel Madri

Jacob Kramer

Penelope Taylor

Aaron Manders

Matt Miller

Manuel Hernandez

Fenna Kreinen

- Somerville
- Union Square
- Us2
- Politics
- Development

Like what you read? Give Matt Lavallee a round of applause.

From a quick cheer to a standing ovation, clap to show how much you enjoyed this story.

Matt Lavallee

Also tagged Politics

The "Other Side" Is Not Dumb.

Sean Blanda

Also tagged Politics

John McCain—In Life And Death—Was The Hero 2018 Needed

Alex Whitcomb

Also tagged Development

10 Interview Questions Every JavaScript Developer Should Know

Eric Elliott

Responses

Applause from Matt Lavallee (author)

mem_somerville

May 3, 2017

Thanks very much for this report. I'm working with some neighbors on forming a Winter Hill neighborhood association, and we are trying to learn from the experience of other folks in case this comes our way.

We should be prepared to have signs with our zip codes on them, like constituents are doing at their town halls to show who is really a resident.

Applause from Matt Lavallee (author)

Richard Hughes

May 3, 2017

This is deeply disappointing.

MEMORANDUM OF UNDERSTANDING:

TRAFFIC AND AIR QUALITY MITIGATION

FOR THE

CENTRAL ARTERY/THIRD HARBOR TUNNEL PROJECT

1. Parties. The parties to this agreement are the Executive Office of Transportation and Construction of the Commonwealth of Massachusetts ("EOTC"), the Massachusetts Department of Public Works ("MDPW"), and the Conservation Law Foundation ("CLF")(hereafter collectively referred to as "the parties").

2. Need for Mitigation Measures. The parties agree that:

The Central Artery/Third Harbor Tunnel Project ("the Artery/Tunnel Project") can play a major role in producing significant long-term improvements in traffic congestion and air quality;

In order to ensure these improvements in conditions, the parties acknowledge the desirability of implementing new and expanded measures to provide transportation by alternative modes and to increase the efficiency of use of the highway system that includes the Central Artery and harbor tunnels;

The 1990 amendments to the Clean Air Act impose major new requirements on Massachusetts, making it essential for the Commonwealth to position itself to meet those requirements in a manner that enhances both environmental quality and economic prosperity; and

The implementation of the measures referred to in the preceding paragraphs will contribute to the long-term success of the project under the range of conditions that may prevail in the year 2010 and thereafter.

3. Nature of Commitments in This Agreement. The commitments described in this agreement should be incorporated into the certificate of the Secretary of Environmental Affairs on the final supplemental environmental impact report ("FSEIR") for the Artery/Tunnel Project and into the record of decision for the project issued by the Federal Highway Administration ("FHWA"). The parties agree to take all steps appropriate to their respective offices, and to use their respective authorities and means to the full extent necessary, in urging that the commitments be so incorporated.

These commitments shall be incorporated in the Artery/Tunnel Project, implemented, monitored and enforced to at least the same extent as other mitigation commitments made in the environmental impact statement or report, the secretary's certificate or the record of decision for the Artery/Tunnel Project. They are intended to supplement, not to limit or substitute for, commitments made in the other documents just mentioned. The commitments described herein are intended by the parties to be fully binding and enforceable under any applicable law.

4. Parking Freezes. The MDPW has undertaken a sensitivity analysis of the traffic forecasts used to predict air quality impacts of the project. In that sensitivity analysis, several critical input variables were tested to learn their effect on traffic volumes. The results of this analysis indicate that of all the public policy interventions examined, a parking control policy would be the most effective. A full parking freeze for Boston and Cambridge would lower regional trip ends by 135,000. The parties agree that parking policy represents one of the most important areas for improved environmental control and intervention. New or revised parking freezes that ensure high levels of service (or at least no further deterioration of service) and the attainment of air quality goals without increasing street or road capacity shall be put into effect for East Boston/Revere, South Boston, Downtown Boston and Cambridge and made part of the State Implementation Plan for Massachusetts under the Clean Air Act. The parties agree to take all steps appropriate to their respective offices, using their respective authorities and means to the full extent necessary, to attain these goals.

A. Each freeze shall impose a firm limit on the total number of parking spaces in the geographical area to which the freeze applies. Each such limit shall be calculated to ensure the attainment of level of service and air quality objectives. In addition, it may be appropriate for some or all freezes to require holders of permits for new or existing spaces to establish aggressive employer-based transportation demand management programs, to provide preferences -- through set-aside, pricing, and other requirements and incentives -- for high-occupancy vehicle ("HOV") parking, and/or to provide appropriate preferences for short-term (non-commuter) parking. It may also be appropriate to issue permits on the basis of use-specific ratios of allowable parking spaces per 1000 square feet of space developed, and to vary the ratios used within different districts in a freeze area according to the districts' proximity to mass transit services.

B. The Metropolitan Planning Organization ("MPO") shall submit, in each of its parking freeze submissions to DEP, language which would require that the review and approval of additions to or changes in facilities providing parking spaces in each of the freeze areas shall be administered in accordance with a plan to be submitted to the Governor which sets forth the procedures by which the permitting of facilities in the area shall occur. In the case of the parking freezes implemented by the City of Boston, for example, these permitting procedures would be set forth as a proposed text of amendments to the current BAPCC "Procedures and Criteria for the Issuance of Parking Freeze Permits." Such procedures and criteria are subject to an open public hearing process conducted by DEP. The parties agree to take all steps appropriate to their respective offices, using their respective authorities and means to the full extent necessary, to ensure that they are effective in meeting the intent of the parking freeze.

C. Given that the MPO has, at the recommendation of the Secretary of Transportation and Construction ("Secretary"), proposed a South Boston parking freeze, the Secretary shall transmit the freeze to DEP within fourteen days from the date of this agreement. The parties shall in the ensuing months take all steps necessary to see that the South Boston parking freeze is adopted, and that the Cambridge and Downtown Boston freezes are revised, as quickly as possible in accordance with the previous paragraphs. The parties specifically agree that such revisions shall apply to all off-street spaces, and shall address the current problems created by exemption of employee spaces from the freeze concept.

5. Mass Transit. The use of mass transit by commuters, airport travelers and others in the Boston metropolitan area shall be maximized. EOTC shall complete and provide to the other parties no later than December 31, 1991, an initial study of transit improvement strategies in addition to those called for by this agreement and the FSEIR, and shall make every effort to reach a consensus with the other parties as to the conclusions and implementation of that study by March 31, 1992, at which time it should be addressed in a revised Program for Mass Transportation ("PMT"). The parties agree that all of the public transportation improvements discussed below, including rapid transit, commuter rail, bus, water shuttle and station and parking facility improvements will contribute to the success of the total transit plan. The parties also acknowledge that the implementation of other transit projects contained within the Artery/Tunnel Project, including the replacement of the Dewey Square Bus Station at South Station, the reconstruction of the

Airport Blue Line station, and the creation of the underground right of way for the South Boston Piers access transit project will contribute to the attainment of the Artery/Tunnel Project's environmental goals.

The parties recognize that implementation of most or all of the transit improvements addressed in this agreement is subject to public environmental review processes. If any planned improvement is found in the course of such a review process to have environmental impacts which render the project infeasible, EOTC shall develop and implement a substitute transit facility or service that will serve at least the same number of passengers in the same transportation corridor as the transit improvement contemplated by this agreement. In implementing transit improvements under this agreement, EOTC shall confer with the other parties on a quarterly basis in the manner described below.

EOTC shall also do the following.

A. All of the improvements listed in Appendix A to this agreement shall be completed. EOTC shall make every effort to complete each improvement by the last day of the calendar year stated as the year of completion in Appendix A. EOTC shall begin the operation of each new facility or service by the last day of the calendar year following the stated year of completion.

B. Although new circumferential transit facilities were not assumed in the FSEIS/R forecasts, EOTC shall determine whether and how to connect radial transit service corridors outside the central business district (provide one or more permanent circumferential transit facilities). On the basis of a feasibility study of various alternatives, EOTC shall complete and provide that study to the other parties no later than December 31, 1994, and shall make every effort to reach a consensus with the other parties as to whether and how to provide permanent circumferential transit facilities by September 30, 1995.

C. EOTC agrees to pursue with due diligence the program to attain three hour travel speeds for high speed rail between New York and Boston, as its highest inter-city transportation priority. Second, EOTC agrees to pursue high speed rail services along the inland route connecting Hartford, Springfield and Worcester to Boston. Third, EOTC agrees to work cooperatively with the States of Maine and New Hampshire to attain high speed rail service between Boston and Portland, Maine.

Fourth, EOTC agrees on the desirability of extending

Northeast Corridor service north of South Station, possibly on a new alignment. Toward that end, EOTC shall determine whether and how to provide a rail connection between South Station and Logan Airport on the basis of a feasibility study for such a connection. EOTC shall complete and provide that study to the other parties no later than December 31, 1991, and shall make every effort to reach a consensus with the other parties as to whether and how to provide such a connection by March 30, 1992. EOTC shall complete a preliminary study of the compatibility of planned construction work for the Artery/Tunnel Project with such a connection and provide that study to the other parties no later than February 28, 1991, and shall make every effort to carry out design and construction work for the Artery/Tunnel Project so as not to interfere with the development of a rail connection between South Station and Logan Airport.

D. Given the success of the Massport Braintree terminal project, and given the progress in establishing a multi-modal terminal in Natick, the Secretary shall make every effort to obtain from the Massachusetts Port Authority by June 30, 1991, commitments (1) to develop suburban "remote terminal" facilities designed to reduce automotive travel to Logan Airport, and (2) to expand HOV facilities and services within Logan Airport and to coordinate them with other HOV facilities and services, including those developed as part of or in connection with the Artery/Tunnel Project.

E. EOTC, in cooperation with MDPW, the Massachusetts Port Authority and the Massachusetts Turnpike Authority, shall complete and provide to the other parties by December 31, 1991, a feasibility study of the relocation of some of the existing Sumner Tunnel toll booths to a location along Route 1A, generally in the vicinity of the Airport Blue line station, that would allow for airport users to utilize separate toll booths from those approaching from other directions. Given the ability to differentiate subgroups of tunnel users, EOTC shall examine in that study the use of toll pricing to regulate trips to Logan Airport, acknowledging the needs of airport employees. EOTC shall make every effort to reach a consensus with the other parties as to how best to use toll pricing to regulate vehicle trips to the airport by March 31, 1992.

F. The parties agree that MBTA fares should be indexed so that they do not rise more rapidly than fuel, toll and other costs of automobile use, or than the rate of inflation, whichever rate of increase is lower. The parties

shall make every effort to reach a written consensus by September 30, 1991, on a specific long-term means of accomplishing such indexing to the full extent possible under existing statutes.

G. EOTC shall complete and provide to the other parties no later than September 30, 1991, a feasibility study examining alternative means of providing a water shuttle service from Boston to the North Shore, which shall explore the special problems of commuter operations in open ocean waters and make recommendations concerning strategies to deal with this problem. EOTC shall make every effort to reach a consensus with the other parties as to how best to provide such service by December 31, 1991.

6. Radial Capacity. No expansion of the radial roadways to and from Boston shall be undertaken within the Route 128 radius. Capacity shall not be expanded in either direction through the addition of lanes on any of the radial roadways, although localized improvements necessary to increase safety or to enhance HOV access may be carried out. "Radial roadway" means a roadway whose major peak-hour function is to carry passenger and other vehicles to and from Boston. This commitment shall be incorporated in the State Implementation Plan for Massachusetts under the Clean Air Act. The parties agree to take all steps appropriate to other respective offices, using their respective authorities and means to the full extent necessary, to attain such incorporation.

7. Regulation Governing Roadway Tunnel Ventilation Systems. DEP has published in draft form a proposed regulation governing roadway tunnel ventilation systems in the Boston Metropolitan Air Pollution Control District. The parties shall make every effort to assist DEP in expediting the issuance of a final regulation in order to ensure the attainment and maintenance of the air quality goals of the Artery/Tunnel Project. The parties agree that all appropriate terms of this agreement, including but not limited to those pertaining to the triggering of expanded HOV measures, should be incorporated in any compliance plan that may be submitted for the Artery/Tunnel Project (see proposed 310 CMR 7.38(5)(November 1990)). All commitments in this agreement shall be implemented and enforceable whether or not the measures to be undertaken pursuant to those commitments are also required under the DEP regulation.

8. High-Occupancy Vehicle Facilities. The highest possible level of high-occupancy vehicle ("HOV") utilization shall be attained throughout the entire highway system that includes the Central Artery and harbor tunnels, to the full extent that individual HOV facilities and priority mechanisms

contribute to improved environmental quality and sound traffic management. Both commuters using highways to and from Boston and travelers, patrons and employees using highways to and from Logan Airport should utilize HOVs and mass transit. Conversely, the goal of the commitments made in this memorandum is to reduce to the maximum extent feasible single-occupancy vehicle travel by those two groups and others.

To that end, the parties agree that the actions described below shall be taken. The commitments outlined in this section shall be incorporated in the State Implementation Plan for Massachusetts under the Clean Air Act. The parties agree to take all steps appropriate to their respective offices, using their respective authorities and means to the full extent necessary, to attain such incorporation.

A. Interstate 93 ("I-93") North of the Southern Bank of the Charles River.

Southbound Direction. Prior to commencement of reconstruction of the Central Artery, from the area of the I-93 Charles River bridge, the existing southbound HOV lane shall be extended toward Route 128 to the northernmost point appropriate to maximize use of the lane, using appropriate lane demarcation mechanisms. This shall not be accomplished by the addition of a new lane or lanes to I-93. The Commonwealth will incorporate into the permanent design of the Charles River crossing an HOV lane extending down the exit ramp to Nashua Street, with a head of queue enforcement point at the ramp's intersection with Nashua Street, subject to the review and approval of the FHWA. EOTC and MDPW shall further study and implement additional HOV priority measures, as appropriate, such as metering systems or HOV lanes on ramps, for southbound traffic from the Charles River crossing to Route 128.

Northbound Direction. EOTC and MDPW shall implement appropriate HOV measures if and when such measures are triggered by traffic conditions in the manner described below. In the case of this highway segment, the parties expect a left-hand HOV lane, from the Charles River crossing to the northernmost point toward Route 128 appropriate to maximize use of the lane, to be an appropriate measure. Creation of such a lane shall not be accomplished by the addition of a new lane or lanes to I-93.

B. Southeast Expressway. EOTC and MDPW shall establish an HOV lane or lanes for north- and southbound traffic, from the Interstate 90/Interstate 93 interchange to at least a point immediately north of the Route 128-Route 3

interchange, and extending beyond to the southernmost point appropriate to maximize use of the lane or lanes, prior to May 31, 1993. EOTC shall establish such a lane or lanes sooner if triggered by traffic conditions in the manner described below. The best engineering mechanism to provide faster, more reliable, safe HOV flow shall be determined through a study which EOTC shall complete and provide to the other parties no later than June 30, 1991. The study shall examine relevant engineering, safety and environmental considerations. If an HOV lane or lanes is accomplished by the addition of a new lane or lanes to I-93 or Route 3, any such HOV lane shall remain as a permanent HOV lane and shall at no point be converted to use for general traffic.

C. Massachusetts Turnpike. The Secretary shall take all steps necessary to enhance and expand the Massachusetts Turnpike Authority programs supporting HOVs and to ensure the implementation of the following measures by the Massachusetts Turnpike Authority: a program of special HOV toll booths and full head-of-queue privileges, and wherever practical, specially demarcated lanes leading to those toll booths, at all appropriate turnpike interchanges; and the provision of electronic identification systems. In addition, the Secretary shall complete and provide to the other parties no later than June 30, 1992, a study, undertaken with participation of the Authority, to establish the best mechanism to improve the quality and reliability of HOV flow on the Turnpike between Route 128 and Boston. This study shall examine the feasibility of full-scale HOV lanes and other facilities and mechanisms on the Turnpike through Newton and Boston. Once the appropriate engineering solution has been established, it shall be triggered in the manner described below. Creation of HOV lanes shall not be accomplished by the addition of a new lane or lanes to the Turnpike.

D. Trigger Mechanisms. Preceding paragraphs of this section call for HOV measures to be undertaken in the northbound direction on Interstate 93 north of Boston, and additional HOV measures to be undertaken on the Massachusetts Turnpike, when triggered by traffic conditions. Those measures shall be undertaken for the construction and post-construction period after "triggers" calculated by the parties in the following manner have been reached. Each trigger shall consist of the difference, in minutes, between a pre-construction trip time and a construction period trip time. The specific pre-construction ("baseline") trip times and thresholds ("triggers") for implementing HOV measures, both during and after construction, shall be agreed to in writing by the

parties no later than April 30, 1991. Triggers shall represent a perceptible deterioration from baseline conditions. The collection of data necessary to the determination of baseline trip times shall be undertaken by December 31, 1991.

E. Performance Standards. Performance standards shall be set for HOV trips along the entire length of each corridor referred to in this paragraph, and for trips between all important origins and destinations along each corridor. Specific performance standards shall be agreed to in writing by the parties no later than April 30, 1991. The performance standards shall be set to provide both a travel-time advantage of a sufficient amount and an extremely high level of reliability to HOVs. For example, an appropriate goal for the standards may be to maintain all HOV trip times at no more than 80 percent of non-HOV average trip time or, where adequate HOV flow now exists, at no more than 105% of current HOV average trip time. Standards shall be set, in minutes, for trips along the following corridors wherever HOV lanes or other facilities or mechanisms have been established: (1) Interstate 95-Interstate 93 interchange north of Boston and the Charles River crossing (during the construction period) and Logan Airport entrance (during the post-construction period), by way of Interstate 93 and the Callahan and Sumner Tunnels; (2) Interstate 95-Interstate 90 interchange and South Station (during the construction period) and Logan Airport entrance (during the post-construction period), by way of Interstate 90; and (3) Weymouth to South Station (during the construction period) and Logan Airport entrance (during the post-construction period), by way of the Southeast Expressway and Interstate 90.

F. Continuous Attainment of Performance Standards. Performance of HOV facilities shall be monitored on a continuous basis to determine whether additional measures or changes in HOV operations are warranted. All appropriate measures, such as metering or changes in the HOV eligibility standard, shall be used on a continual basis to the full extent necessary to maintain compliance with performance standards. Even when vehicles with two occupants do not qualify for HOV eligibility, taxis with single passengers may qualify for HOV eligibility. Trip times will be measured as described on page 5 of the construction Mitigation Appendix to the FSEIR for the project or as subsequently agreed to in writing by the parties.

G. Promotion and Enforcement for HOV System. An aggressive HOV promotion program shall be carried out by

EOTC according to a plan to be completed and provided to the other parties by EOTC prior to commencement of reconstruction of the Central Artery. EOTC shall make every effort to reach a consensus with the other parties as to the adequacy of the plan within ninety days from the date when the plan is submitted to the other parties. The plan will be based on a comprehensive review by EOTC, to be summarized in a written report to the other parties no later than April 30, 1991, of techniques used to manage or promote HOV use in other locations throughout the United States and Canada. Effective enforcement of the HOV system shall be provided by EOTC according to a plan to be completed and provided to the other parties by EOTC no later than the date when highway construction work begins for the Artery/Tunnel Project. EOTC shall make every effort to reach a consensus with the other parties as to the adequacy of the enforcement plan prior to December 31, 1991. EOTC shall also ensure that HOV studies targeted at the various needs of Logan Airport passengers, patrons, and employees are conducted.

H. EOTC and MDPW shall use best efforts to ensure that HOV facilities, including special bus and/or taxi lanes, are incorporated into the design, construction and reconstruction of City of Boston streets. The parties agree to consult on the progress of the development of City street designs and shall encourage the adoption of HOV lane designs wherever feasible and appropriate.

9. Mitigation Oversight. The parties agree to meet no less frequently than once in each calendar quarter, from the date of this agreement onward, to review the implementation of the commitments in this agreement and of other mitigation commitments for the Artery/Tunnel Project pertaining to traffic and air quality. The parties expect that more frequent meetings will often be necessary for the parties to confer, review studies and plans, and enter into subsequent agreements as provided in this agreement. EOTC and MDPW agree that when CLF considers additional monitoring or technical data to be necessary to carry out this agreement, EOTC and MDPW shall arrange to obtain such data in a timely and impartial manner. Such data shall be obtained through the services of an independent person or entity with relevant expertise, at the expense of EOTC and/or MDPW, where a reasonable difference of opinion exists regarding the nature or extent of the data to be obtained, the manner of data collection, or other such matters.

10. Future Support. In recognition of the importance of the Commonwealth's long-term commitments in this agreement to the attainment of transportation and air quality improvements, and on the condition that the commitments in this agreement are

incorporated into the certificate of the Secretary of Environmental Affairs on the FSEIR and into the record of decision issued by FHWA, CLF agrees not to commence, maintain or participate in any action or legal proceeding challenging the adequacy of the environmental documentation for the Artery/Tunnel Project, including the Central Artery North Area Project. CLF specifically reserves the right to take any action necessary to enforce this Memorandum of Understanding. CLF agrees to support actively and in good faith the Artery/Tunnel Project and the implementation of the improvements and other measures undertaken pursuant to this agreement or pursuant to other mitigation commitments in the documents referred to in section 3 above, while reserving the right to recommend further improvements that can be made without delaying the project. CLF specifically agrees to pursue intervention, subject to the approval of its Board of Directors, on behalf of the Commonwealth upon request in a law suit or law suits brought against the Commonwealth in which a third party (other than a state or federal regulatory agency) challenges the adequacy of the environmental documentation for the Artery/Tunnel Project, for the purpose of asserting the public interest in the transportation and air quality improvements resulting from the Artery/Tunnel Project and the mitigation measures undertaken in connection with the project. CLF agrees to take all steps consistent with this agreement and to use its resources vigorously in carrying out the commitments

made in this paragraph.

Frederick P. Salvucci
Secretary of Transportation
and Construction

Jane F. Garvey
Commissioner of Public Works

Douglas I. Foy
Executive Director,
Conservation Law Foundation

Commonwealth of Massachusetts
Suffolk County

Sworn to and subscribed before me on this 19th day of December, 1990.

Carey B. Zimmerman, Notary Public
My commission expires January 10, 1997.

Appendix A

Project	Year of Completion
Commuter Rail	
Old Colony Line Extension	1995
Ipswich Line Extension to Newburyport	1993
Framingham Line Extension to Worcester	1995
Lynn Central Square Station and Parking Garage	1991
North Station High Platforms New Tracks	1991
South Station Track 12	1993
Rapid Transit	
South Station Access to Red Line	1991
Blue Line Connection from Bowdoin Station to Red Line at Charles Station	2010
Blue Line Platform Lengthening and Modernization	1997
Green Line Extension to Ball Square/ Tufts University	2010
Green Line Arborway Restoration	1996
Bus	
South Station Bus Terminal	1993
Lynn Transit Station Bus Terminal	1991
South Boston Piers Electric Bus Service	2000
Park & Ride	
Addition of 10,000 spaces systemwide, outside of Boston	1995
Addition of a further 10,000 spaces systemwide, outside of Boston	1998

United States District Court
District of Massachusetts

FILED
IN CLERKS OFFICE

2005 MAR 14 P 1:43

U.S. DISTRICT COURT
DISTRICT OF MASS.

CONSERVATION LAW FOUNDATION, INC.,

Plaintiff,

v.

MITT ROMNEY, in his official capacity as GOVERNOR OF MASSACHUSETTS; DOUGLAS I. FOY, in his official capacity as SECRETARY OF THE OFFICE FOR COMMONWEALTH DEVELOPMENT and CHAIRMAN OF THE COMMONWEALTH DEVELOPMENT COORDINATING COUNCIL; THE MASSACHUSETTS BAY TRANSPORTATION AUTHORITY; DANIEL GRABAUSKAS, in his official capacity as SECRETARY OF THE EXECUTIVE OFFICE OF TRANSPORTATION and CHAIRMAN OF THE MASSACHUSETTS BAY TRANSPORTATION AUTHORITY; MICHAEL H. MULHERN, in his official capacity as GENERAL MANAGER OF THE MASSACHUSETTS BAY TRANSPORTATION AUTHORITY; THE MASSACHUSETTS TURNPIKE AUTHORITY; MATTHEW J. AMORELLO, in his official capacity as CHAIRMAN OF THE MASSACHUSETTS TURNPIKE AUTHORITY; JOHN COGLIANO, in his official capacity as COMMISSIONER OF THE MASSACHUSETTS HIGHWAY DEPARTMENT; and ROBERT W. GOLLEDGE, in his official capacity as COMMISSIONER OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION,

Defendants.

Civil Action

No.

COMPLAINT

05-10487 NG

INTRODUCTION

1. The Conservation Law Foundation ("CLF") seeks declaratory, injunctive and other relief in this action with respect to actions and failures to act of various officials

of the Commonwealth of Massachusetts ("Massachusetts") in violation of the Federal Clean Air Act ("CAA"), 42 U.S.C. § 7401 et seq.

2. The defendants have failed and continue to fail to implement air quality emission standards and limitations in the form of public transportation improvements and measures that Massachusetts has committed to undertake on a prescribed schedule pursuant to the terms of its CAA state implementation plan ("SIP"). These enforceable standards and limitations were required, in large part, to offset or otherwise mitigate the significant air quality impacts of the Central Artery/Tunnel Project ("CA/T Project").

3. The CA/T Project is a massive, nearly $15 billion transportation project that significantly expands highway capacity in downtown Boston by adding travel lanes and vehicular capacity to the formerly six-lane Central Artery (Interstate 93) and by doubling the tunnel capacity in the metropolitan Boston area with the addition of the four-lane Ted Williams Tunnel across Boston Harbor.

4. To offset or otherwise mitigate the negative air quality and public health impacts of this expanded arterial and tunnel capacity, Massachusetts committed to a number of federally-enforceable emission standards and limitations in the form of public transportation improvements and other transportation measures. While the highway portion of the CA/T Project is now nearly complete, many of the required transit projects are now significantly and unreasonably delayed. Other of these required transit projects are significantly behind schedule and, upon information and belief, cannot be completed by the prescribed SIP deadline. By failing to satisfy these SIP transit commitments, defendants are in violation of the CAA.

5. By this action, plaintiff CLF seeks judicial relief to compel defendants to complete the transit projects specified in the Massachusetts SIP on a judicially-enforceable schedule and to provide sufficient mitigation for the environmental degradation experienced from delays associated with these projects. CLF also seeks other judicial relief to which it is entitled.

PARTIES

Plaintiff

6. CLF is a non-profit membership organization dedicated to the use of law, science, and economics to improve resource management, environmental quality and public health throughout New England. CLF's principal place of business is located at 62 Summer Street, Boston, Massachusetts 02110. CLF has a membership of approximately 5,000 individuals throughout New England. Many of CLF's members reside in the metropolitan Boston region.

7. CLF's organizational goals include protecting and conserving the environment of Massachusetts and the public health of its members and other Massachusetts residents by reducing air pollution in metropolitan Boston as well as elsewhere in the state.

8. CLF has had a significant history in advocating and fighting for clean air in the metropolitan Boston area and Massachusetts on behalf of its members. CLF has frequently been granted standing in federal litigation in the United States District Court for the District of Massachusetts and in other jurisdictions on behalf of its adversely affected members.

9. CLF has an extensive history of involvement in the specific air pollution issues that are at issue in this action. On behalf of its adversely affected members, CLF participated extensively in the regulatory proceedings that led to the development and promulgation of the Massachusetts SIP with respect to the CA/T Project. On behalf of those same members, CLF made continuous and extensive efforts to ensure that the transportation control measures set forth in the Massachusetts SIP with respect to the CA/T Project were implemented on schedule and according to their terms.

10. CLF has been involved or attempted to be involved on behalf of its adversely affected members in numerous state permit proceedings, administrative proceedings, public hearings, and public comment proceedings with respect to the timely implementation of the Massachusetts SIP requirements associated with the CA/T Project.

11. CLF brings this action on behalf of its adversely affected members to enforce the emission standards and limitations of the Massachusetts SIP. Many CLF members reside, work, or otherwise spend time in parts of eastern Massachusetts where unlawfully high levels of ozone pollution result from emissions from motor vehicle traffic in metropolitan Boston.

12. The Massachusetts SIP was approved by the United States Environmental Protection Agency ("EPA") in order to ensure, inter alia, that the hazardous ozone levels in metropolitan Boston would be reduced to levels that did not cause or contribute to injury or risks of physical harm to people through the implementation of the SIP's emission standards and limitations. As a result of the delays alleged in this action, CLF members who breathe the air while residing, working or spending time in metropolitan Boston suffer and will continue to suffer actual physical harm to their bodies and an

increased risk of physical harm from their exposure to unhealthful ozone levels. These members are also suffering and will continue to suffer negative impacts on their quality of life as a result of this continuing harm and risk of harm. The SIP requirements that CLF seeks to enforce in this action were specifically developed and approved by the EPA for the purpose of reducing the exposure of people in the metropolitan Boston area to ozone.

13. CLF also brings this action on behalf of its members who reside, work or otherwise spend time in the Boston metropolitan region who are adversely affected and will continue to be adversely affected by the delays in the implementation of required public transit improvements required under the Massachusetts SIP. These members would use and depend on the public transportation projects set forth in the SIP if they were constructed and were operational as required in the SIP. The delays and failures to implement the requirements of the SIP are causing these CLF members specific injury in the forms of additional expense and time in delays spent commuting to work or to other destinations in metropolitan Boston. These injuries would be reduced or eliminated if the emission standards and limitations in the Massachusetts SIP were implemented on a timely basis as required by the CAA.

Defendants

14. Defendant Mitt Romney is the Governor of Massachusetts. The Governor is the chief executive officer of Massachusetts and has the ultimate responsibility for ensuring that the state is in compliance with the SIP adopted by Massachusetts and approved by the EPA. States have primary responsibility for assuring air quality under the Clean Air Act and must promulgate and implement SIPs to that end.

15. Defendant Douglas I. Foy is the Secretary of the Office for Commonwealth Development and Chair of the Commonwealth Development Coordinating Council. Mr. Foy has responsibility for overseeing Massachusetts' transportation and environmental agencies. He is charged with protecting natural resources and supporting a range of convenient and affordable transportation choices. He is also required to coordinate and make recommendations regarding capital planning and to develop long-term statewide transportation planning.

16. Defendant Massachusetts Bay Transportation Authority ("MBTA") is an independent transit authority. The MBTA must carry out most of the public transportation projects at issue here.

17. Defendant Daniel A. Grabauskas is the Secretary of the Executive Office of Transportation ("EOT") and Chairman of the MBTA. EOT was created in 2004 as part of a governmental reorganization plan and, upon information and belief, has assumed all the duties and responsibilities of the former Executive Office of Transportation and Construction ("EOTC") including specifically EOTC's responsibilities under the Massachusetts SIP. EOTC is specifically named in the Massachusetts SIP as the agency responsible for the transit requirements at issue.

18. Defendant Michael H. Mulhern is the General Manager of the MBTA. Mr. Mulhern has authority over and responsibility for the planning and budgeting processes of the agency, which must actually carry out most of the public transportation requirements at issue here.

19. Defendant Massachusetts Turnpike Authority ("MTA") is an independent authority. In 1997, Massachusetts enacted the Metropolitan Highway System Act,

M.G.L. 81A, which transferred authority over the CA/T Project from the Massachusetts Highway Department ("MHD") to the MTA. That legislation specifically provides that all CA/T Project-related mitigation commitments will be allocated between and satisfied by MHD and MTA.

20. Defendant Matthew J. Amorello is the Chairman of the MTA. The MTA received authority over the CA/T Project pursuant to the Metropolitan Highway System Act, M.G.L. 81A, which transferred authority over the CA/T Project from the Massachusetts Highway Department ("MHD") to the MTA and provided that all CA/T Project-related mitigation commitments will be allocated between and satisfied by MHD and MTA.

21. Defendant John Cogliano is the Commissioner of MHD, the agency that had complete authority of the CA/T Project until 1997. Pursuant to the Metropolitan Highway System Act, M.G.L. 81, § 12, which transferred some authority over the CA/T Project from MHD to MTA, the two agencies were directed to allocate responsibility for satisfying all CA/T Project-related commitments between them.

22. Defendant Robert W. Golledge is the Commissioner of the Department of Environmental Protection ("DEP"). DEP is a signatory on the Administrative Consent Order regarding Massachusetts' public transportation obligations under the CAA. The SIP was promulgated pursuant to DEP's authority and DEP has duties and obligations with respect to the provisions of the SIP regarding Massachusetts' public transportation obligations. DEP has taken action that may be at issue in this proceeding, and given DEP's roles and responsibilities, Commissioner Golledge is a necessary party for appropriate remedial action.

JURISDICTION AND VENUE

23. The United States District Court has jurisdiction over this action pursuant to 42 U.S.C. § 7604, governing citizen suits under the Clean Air Act.

24. On January 12, 2005, notice of the CLF's intent to commence this action alleging the defendants to be in violation of emission standards or limitations under the CAA was duly served on the defendants by certified mail in accordance with Section 304(b) of the Clean Air Act, 42 U.S.C. § 7604(b), and its implementing regulations. 40 C.F.R. Part 54. A true and correct copy of that notice is attached hereto as Exhibit 1.

25. Sixty (60) days have passed between the service of CLF's notice referenced above and the filing of this complaint.

26. Neither the EPA nor the Commonwealth of Massachusetts has commenced or is diligently prosecuting a civil action against the defendants for violations identified in CLF's CAA notice in a United States or Massachusetts court.

27. Venue in this action is proper in the District of Massachusetts in that all the defendants reside in Massachusetts, a substantial part of the events or omissions giving rise to the claims stated herein have occurred in this district, and this action is not founded on diversity of citizenship.

STATUTORY AND REGULATORY BACKGROUND

The Clean Air Act

28. The federal Clean Air Act, 42 U.S.C. §§ 7401-7671q, is the principal federal statute enacted to protect the citizens of the United States from the public health and welfare threats associated with air pollution.

29. Under the CAA, the Administrator of the EPA has established National Ambient Air Quality Standards ("NAAQS") for a number of air pollutants, including ozone, at levels necessary to protect the public health and welfare.

30. Under the CAA, individual states must develop and incorporate enforceable emission control strategies into regulatory programs known as "state implementation plans." A SIP must provide for implementation, maintenance and enforcement of the NAAQS. The requirements and commitments set forth in a state SIP become binding as a matter of federal law on the states.

31. The EPA has a process by which it designates geographical areas where the ambient air quality exceeds the NAAQS as "non-attainment areas." In states that have been designated as "non-attainment" for one or more of the NAAQS, the SIP must provide for attainment of the NAAQS as expeditiously as practicable. The CAA set a deadline for NAAQS attainment but authorized EPA to extend that deadline under certain circumstances.

32. Massachusetts has not attained the NAAQS for ozone. Massachusetts has been designated as in "serious non-attainment" of the one-hour ozone standard and "moderate non-attainment" of the eight-hour ozone standard. Massachusetts was originally required to come into attainment with the NAAQS for ozone by 1999. Upon information and belief, this deadline was extended to 2003 and later to 2007.

33. Ground-level ozone forms in the atmosphere when volatile organic compounds and nitrogen oxide emissions, known as ozone "precursors," react in the presence of heat and sunlight. Emissions from automobiles significantly contribute to high ozone levels. Ozone is the major constituent of smog and a powerful respiratory

irritant which, at relatively low levels of exposure, causes reduced lung function and the deterioration of lung tissue, and which has been linked to increased susceptibility to respiratory infection.

34. Ozone is particularly harmful to children, to elderly people, and to people with pre-existing respiratory conditions such as asthma, bronchitis and emphysema. Ozone causes long-term, potentially permanent lung damage beginning in early years of life and contributes to more serious effects with increasing exposure. Symptoms resulting from ozone exposure include eye irritation, headaches, coughing, chest discomfort, shortness of breath and difficulty in breathing.

Relevant History of the Massachusetts SIP

35. The CA/T Project expanded highway capacity, doubling harbor tunnel capacity and enlarging the formerly six-lane Central Artery (Interstate 93) into a ten-lane highway. As a condition of federal approval of the CA/T Project, Massachusetts made binding commitments to complete a number of public transportation improvement projects to counter the air quality impacts of expanded highway capacity in the Boston metropolitan area. These commitments became federally enforceable emission standards or limitations through Massachusetts' approved SIP.

36. Several of the public transportation improvements designed to mitigate air quality impacts of the CA/T Project were made binding through certification of the tunnel ventilation system used for the CA/T Project. In early 1991, the Department of Public Works, now MHD, submitted a "preconstruction certification" for the CA/T Project to DEP pursuant to a state regulation governing "Certification of Tunnel Ventilation Systems in the Metropolitan Boston Air Pollution Control District" codified at 310 CMR

7.38. A true and correct copy of 310 CMR 7.38 is attached as Exhibit 2. This regulation requires transportation agencies to make specified certifications regarding air quality impacts to DEP prior to beginning construction of certain highway projects, establishes the procedure for seeking DEP's acceptance of preconstruction certification, and authorizes DEP to accept, reject or grant conditional acceptance of a certification.

37. DEP submitted 310 CMR 7.38 to EPA, and EPA approved the regulation as part of the Massachusetts SIP under the CAA.

38. MHD's preconstruction certification (the "Vent Stack Permit"), issued pursuant to 310 CMR 7.38, included a set of proposed mitigation commitments, including public transportation commitments. Accepting these proposed commitments in the Vent Stack Permit, DEP expressly conditioned the construction and eventual operation of the CA/T Project on the continued progress and final implementation of mitigation commitments included in the Vent Stack Permit. A true and correct copy of the Vent Stack Permit is attached hereto as Exhibit 3.

39. The Vent Stack Permit was amended on September 1, 2000. A true and correct copy of the Amended Vent Stack Permit is attached hereto as Exhibit 4.

40. Many of the public transportation requirements in the Vent Stack Permit and certain additional public transportation requirements are codified directly in "U Transit System Improvements," 310 CMR 7.36 (the "Transit Regulation"). The Transit Regulation is part of the EPA-approved SIP. A true and correct copy of 310 CMR 7.36 is attached hereto as Exhibit 5.

41. The public transportation requirements and commitments in the Transit Regulation and in the Vent Stack Permit, which are specifically incorporated here by

reference to 310 CMR 7.36 and 7.38 and to the Vent Stack Permit, constitute "emission standards or limitations" subject to enforcement pursuant to the citizen suit jurisdiction created by the CAA.

42. The Vent Stack Permit includes procedures for addressing delays in project completion. These procedures require that, if implementation of a specific transportation requirement is delayed, an interim measure should be implemented to offset that delay. Specifically, the Vent Stack Permit requires that if a project cannot be completed by the specified deadline, EOT must provide notice to DEP "and within sixty (60) days of said notice, provide an alternative mitigation measure and/or schedule which achieves a reduction in vehicle miles traveled which is equal to, or greater than, the measure which could not be implemented."

43. The Transit Regulation also provides a mandatory procedure in the case of project delay. The Transit Regulation requires that sixty days prior to any delay in project completion, notification must be given, including an explanation of reasons for the delay, the measures being taken to reduce the delay and a new proposed alternative project completion deadline. A substitute project must be proposed, according to the Transit Regulation, for any project expected to be delayed more than three years beyond the deadline established in the Transit Regulation.

44. While the CA/T Project is nearly complete and open to expanded vehicle traffic, several of the public transportation measures in effect under the SIP through the Vent Stack Permit and Transit Regulation have not been complied with as required by the SIP. The urban public transportation requirements would improve air quality in the areas

where the traffic increases and air quality impacts of the construction and operation of the CA/T Project are greatest: in the Boston metropolitan area.

45. On September 1, 2000, DEP and the Executive Office of Transportation and Construction, the agency which became EOT, negotiated an Administrative Consent Order # ACO-00-7001 (the "ACO"). A true and correct copy of the ACO is attached hereto as Exhibit 6. The ACO purported to address delay in completion of the public transportation requirements contained in the Transit Regulation and Vent Stack Permit. In negotiating the ACO, however, EOTC and DEP failed to comply with the prescribed provisions of the Vent Stack Permit itself and the Transit Regulation regarding delay in project completion. See paragraphs 42 and 43, supra.

46. The ACO was subsequently amended in 2002 (the "Amended ACO") and 2005 (the "Second Amended ACO"). True and correct copies of the Amended ACO and the Second Amended ACO are attached as Exhibits 7 and 8 respectively. The Amended ACO and Second Amended ACO did not comply with the prescribed procedures for addressing delay in project completion specified in the Transit Regulation and Vent Stack Permit in effect under the SIP.

47. The ACO, Amended ACO and Second Amended ACO are in the form of contractual agreements between DEP and EOT. They have not been reviewed or approved by the EPA as a modification of the Massachusetts SIP with respect to the specific emission standards and limitations set forth in the Transit Regulation or the Vent Stack Permit.

48. Because EOT and DEP failed to comply with the procedural requirements of the Vent Stack Permit and Transit Regulation for addressing noncompliance with the

public transportation commitments in the SIP, the ACOs are not valid modifications of the specific requirements of the Transit Regulation and Vent Stack Permit in effect under the SIP.

49. The exclusive procedure for SIP modification is set out at 40 C.F.R. § 51. EPA has not approved any changes to the emission standard or limitation provisions of the SIP relevant to the Vent Stack Permit or the Transit Regulation through this procedure.

COUNT ONE: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to add rolling stock of 46 cars to the Orange Line.

50. Paragraphs 1-49 are incorporated herein by reference and pleaded as if fully set forth.

51. The Vent Stack Permit requires that the defendants add 46 cars to the rolling stock of the MBTA's Orange Line by December 31, 1995. The Amended Vent Stack Permit extended the deadline for this requirement to December 31, 2000.

52. The commitment to purchase and use 46 additional cars of rolling stock on the Orange Line is an emission standard or limitation in effect under the SIP for purposes of the CAA.

53. Defendants did not purchase or add 46 additional cars for the Orange Line by December 31, 2000.

54. Such failures to act represent a violation of an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

COUNT TWO: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to modernize and lengthen MBTA Blue Line platforms.

55. Paragraphs 1-49 are incorporated herein by reference and pleaded as if fully set forth.

56. The Transit Regulation and the Vent Stack Permit require that all of the platforms on the MBTA's Blue Line be modernized and lengthened. The Transit Regulation requires that this project be completed by December 31, 1998. The Vent Stack Permit requires that this project be completed by December 31, 2000.

57. The commitment to modernize and lengthen all the platforms on the Blue Line is an emission standard or limitation in effect under the SIP for purposes of the CAA.

58. Defendants failed to modernize and lengthen all the platforms on the Blue Line by either December 31, 1998 or by December 31, 2000. Defendants continue to fail to achieve compliance with this SIP requirement.

59. Such failures to act violate an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

<u>COUNT THREE: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to restore the Arborway Line.</u>

60. Paragraphs 1-49 are incorporated herein by reference and pleaded as if fully set forth.

61. The Transit Regulation requires that the Arborway Line on the MBTA's Green Line be restored to streetcar or trolley service by December 31, 1997.

62. The Arborway Line restoration project is an emission standard or limitation in effect under the SIP.

63. Defendants have failed to restore the Arborway Line by December 31, 1997.

64. Such failures to act violate an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

COUNT FOUR: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to complete the Old Colony Greenbush Line.

65. Paragraphs 1-49 are incorporated herein by reference and pleaded as if fully set forth.

66. The Transit Regulation and the Vent Stack Permit require that the defendants build and place the Old Colony Greenbush Line in service. The Transit Regulation requires that this project be completed by December 31, 1996 and the Vent Stack Permit requires that it be completed by December 31, 1995.

67. The requirement to complete the Old Colony Greenbush Line by December 31, 1996 or December 31, 1995 is an emission standard or limitation in effect under the SIP.

68. Defendants failed to complete the Old Colony Greenbush Line on schedule and continue to fail to comply with this SIP requirement.

69. Such failures to act violate an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

COUNT FIVE: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to take steps necessary to meet the completion deadline for the Red-Blue Connector.

70. Paragraphs 1-49 are incorporated herein by reference and pleaded as if fully set forth.

71. The Transit Regulation and the Vent Stack Permit require the Defendants to complete a connection from the MBTA's Blue Line at Bowdoin Station to the MBTA's Red Line at Charles Station (the "Red-Blue Connector"). The Vent Stack Permit requires that the Red-Blue Connector be complete by December 31, 2000. That deadline was extended in the amended Vent Stack Permit to December 31, 2011. The Transit Regulation also requires that this project be complete by December 31, 2011.

72. The requirement to complete the Red-Blue Connector by 2011, including by necessary implication all conditions precedent to ensure that such obligation is met in a timely manner such as project planning, securing project funding, project design, obtaining environmental permits and approvals, land acquisition, and construction, is an emission standard or limitation under the SIP.

73. Upon information and belief, no funding has been programmed for the design, planning or construction of this project through 2010. The MBTA's 2005 Capital Investment Program, which authorizes funds for capital investments through 2010, does not include authorization of any funds for the Red-Blue Connector. Upon information and belief, defendants have not performed any substantial work with respect to the project design, obtaining environmental permits and approvals, the construction bidding process, land acquisition or construction with respect to the Red-Blue Connector.

74. Upon information and belief, as a result of defendants' failure to program project funds, to undertake design, planning, and environmental reviews, and to prepare the project for construction, it is impossible for the Red-Blue Connector to be completed by December 31, 2011.

75. Defendants have failed to take those actions necessary to ensure that the Red-Blue Connector is completed on schedule.

76. Such failures to act violate an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

COUNT SIX: Defendants are in violation of an enforceable emission standards or limitations in effect under the SIP for failure to take steps necessary to meet the completion deadline for the Green Line extension to Medford Hillside.

77. Paragraphs 1-49 are incorporated herein by reference and pleaded as if fully set forth.

78. The Transit Regulation and the Vent Stack Permit require the defendants to take all necessary steps to extend the MBTA's Green Line to Medford Hillside ("Green Line Extension"). The Vent Stack Permit requires that the Green Line Extension be completed by December 31, 2010. The Amended Vent Stack Permit and Transit Regulation require that the Green Line Extension be completed by December 31, 2011.

79. The requirement to complete the Green Line Extension by December 31, 2011, including by necessary implication all the conditions precedent to ensure that such obligation is met such as project planning, securing project funding, project design, obtaining environmental permits and approvals, land acquisition, and construction, is an emission standard or limitation under the SIP.

80. Upon information and belief, no funding has been programmed for the construction of this project through 2010. The MBTA's Capital Investment Program, which authorizes funds for capital investments through 2010, does not include any funds to construct this project. Upon information and belief, defendants have not performed any substantial work with respect to project design, obtaining environmental permits and

approvals, the construction bidding process, or land acquisition or construction with respect to the Green Line Extension.

81. Upon information and belief, as a result of defendant's failure to program project funds, to undertake design and planning, to obtain environmental reviews and approvals, and to prepare the project for construction it is not possible for the Green Line Extension to be completed by December 31, 2011.

82. Defendants have failed to take those actions necessary to ensure that the Green Line Extension will be completed on schedule.

83. Such failures to act violate an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

COUNT SEVEN: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to provide adequate interim mitigation for delay in completion of Washington Street Replacement Service as required by the Vent Stack Permit.

84. Paragraphs 1-49 are incorporated herein by reference and pleaded as if fully set forth.

85. The Vent Stack Permit requires that alternative mitigation projects must be provided that achieve "Vehicle Miles Traveled" reductions equal to or greater than any measures that cannot be completed according to the schedule contained in the Vent Stack Permit.

86. The Vent Stack Permit requirement that alternate mitigation projects be identified and implemented for project delays is an emission standard or limitation in effect under the SIP.

87. The deadline for the Washington Street Replacement Service project required by the Vent Stack Permit was December 31, 1994. The Amended Vent Stack Permit extended this compliance date to December 31, 1999.

88. Washington Street Replacement Service was not completed until the Silver Line Phase I was opened in July, 2002, providing "bus rapid transit" service along Washington Street, almost 30 months after the SIP deadline. Interim mitigation measures have not been provided that achieve equal or greater reductions in "Vehicle Miles Traveled" to mitigate or offset the emission impacts of this delay.

89. The requirement to undertake a project to mitigate the delays on implementation of the Washington Street Replacement Service is an emission standard or limitation in effect under the SIP.

90. Defendants have failed to take those actions necessary to ensure that an equivalent mitigation project was completed on schedule and continue to fail to comply with this SIP requirement.

91. Such failures to act violate an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

<u>COUNT EIGHT: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to provide adequate interim mitigation for delay in completion of the South Boston Transitway as required by the Vent Stack Permit.</u>

92. Paragraphs 1-49, 85 and 86 are incorporated herein by reference and pleaded as if fully set forth.

93. The deadline for completing the South Boston Transitway is December 31, 1998 in the Vent Stack Permit and December 31, 2001 in the Amended Vent Stack Permit.

94. The South Boston Transitway was not completed until the Silver Line Phase II was opened in December 2004, providing "bus rapid transit" service to South Boston.

95. Interim mitigation measures have not been provided that achieve equal or greater reductions in Vehicle Miles Traveled to mitigate or offset the emissions impacts of this three-year delay.

96. The requirement to undertake a project to mitigate the delays on implementation of the South Boston Transitway is an emission standard or limitation in effect under the SIP.

97. Defendants have failed to take those actions necessary to ensure that an equivalent mitigation project was completed on schedule and continue to fail to comply with this SIP requirement.

98. Such failures to act violate an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

COUNT NINE: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to provide adequate interim mitigation for delay in purchase of 46 cars for the Orange Line as required by the Vent Stack Permit.

99. Paragraphs 1-49, 85 and 86 are incorporated herein by reference and pleaded as if fully set forth.

100. Defendants have failed to provide adequate interim mitigation to offset the air quality impacts of delayed purchase of 46 cars for the Orange Line. The deadline for the purchase of 46 Orange Line Cars was December 31, 1995 in the Vent Stack Permit and December 31, 2000 in the Amended Vent Stack Permit. Defendants have not purchased 46 cars for the Orange Line.

101. Interim mitigation measures have not been provided that achieve equal or greater reductions in Vehicle Miles Traveled to mitigate the emissions impacts of this delay.

102. The requirement to undertake a project to mitigate the delays on purchasing the Orange Line cars is an emission standard or limitation in effect under the SIP.

103. Defendants have failed to take those actions necessary to ensure that an equivalent mitigation project was completed on schedule and continue to fail to comply with this SIP requirement.

104. Such failures to act violate an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

<u>COUNT TEN: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to provide adequate interim mitigation for delay in completion of Blue Line Platform Lengthening as required by the Vent Stack Permit.</u>

105. Paragraphs 1-49, 85 and 86 are incorporated herein by reference and pleaded as if fully set forth.

106. Upon information and belief, defendants have failed to provide interim mitigation to offset the air quality impacts of delayed completion of the Blue Line platform lengthening project. The deadline for Blue Line platform lengthening is December 31, 2000 in the Vent Stack Permit and in the Amended Vent Stack Permit.

107. Blue Line platform lengthening has not been completed.

108. Interim mitigation measures have not been provided that achieve equal or greater reductions in Vehicle Miles Traveled to mitigate the emission impacts of this delay.

109. The requirement to undertake a project to mitigate the delays on lengthening the Blue Line platforms is an emission standard or limitation in effect under the SIP.

110. Defendants have failed to take those actions necessary to ensure that an equivalent mitigation project was completed on schedule and continue to fail to comply with this SIP requirement.

111. Such failures to act violate an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

<u>COUNT ELEVEN: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to provide adequate interim mitigation for delay in completion of restoration of the Old Colony Greenbush Line as required by the Vent Stack Permit.</u>

112. Paragraphs 1-49, 85 and 86 are incorporated herein by reference and are pleaded as if fully set forth.

113. Defendants have failed to provide adequate interim mitigation to offset the air quality impacts of delayed completion of the Old Colony Greenbush Line. The deadline for completion of the Old Colony Greenbush Line was December 31, 1995 in the Vent Stack Permit.

114. Interim mitigation measures have not been provided that achieve equal or greater reductions in Vehicle Miles Traveled to mitigate the emission impacts of this delay.

115. The requirement to undertake a project to mitigate the delays on completion of the Old Colony Greenbush Line is an emission standard or limitation in effect under the SIP.

116. Defendants have failed to take those actions necessary to ensure that an equivalent mitigation project was completed on schedule and continue to fail to comply with this SIP requirement.

117. Such failures to act violate an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

COUNT TWELVE: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to provide adequate interim mitigation for delay in completion of the Red-Blue Connector as required by the Vent Stack Permit.

118. Paragraphs 1-49, 85 and 86 are incorporated herein by reference and pleaded as if fully set forth.

119. Defendants have failed to provide adequate interim mitigation to offset the air quality impacts of delayed completion of the Red-Blue Connector. The deadline for the Red-Blue Connector in the Vent Stack Permit was December 31, 2000. This deadline was changed to December 31, 2011 and defendants are not on schedule to complete the project even by that date.

120. Interim mitigation measures have not been provided that achieve equal or greater reductions in Vehicle Miles Traveled to mitigate the emission impacts of this delay in completion of the Red-Blue Connector from December 31, 2000.

121. The requirement to undertake a project to mitigate the delay of the Red-Blue Connector from December 31, 2000 is an emission standard or limitation in effect under the SIP.

122. Defendants have failed to take those actions necessary to ensure that an equivalent mitigation project was completed on schedule and continue to fail to comply with this SIP requirement.

123. Such failures to act violate an emission standard or limitation in effect under the SIP and constitute a continuing violation of the CAA.

COUNT THIRTEEN: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to provide adequate interim mitigation for delay in completion of Blue Line Platform Lengthening and Modernization as required by the Transit Regulation.

124. Paragraphs 1-49 are incorporated herein by reference and pleaded as if fully set forth.

125. The Transit Regulation requires substitute interim projects for transportation projects that are delayed more than three years beyond the deadline established in the Transit Regulation.

126. The Transit Regulation requirement to implement substitute interim projects for projects that are delayed more than three years is an emission standard or limitation in effect under the SIP.

127. Defendants have not provided adequate interim mitigation for the Blue Line Platform Lengthening and Modernization project, which has been delayed more than three years beyond the deadline in the Transit Regulation.

128. The Transit Regulation requires that Blue Line Platform Lengthening and Modernization be complete by December 31, 1998. This project still has not been completed.

129. The failure to provide interim mitigation to offset the more than three-year delay in completion of Blue Line Platform Lengthening and Modernization after the

deadline in the Transit Regulation is a violation of an emission standard or limitation in effect under the SIP and constitutes a continuing violation of the CAA.

COUNT FOURTEEN: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to provide adequate interim mitigation for delay in completion of the Old Colony Greenbush Line as required by the Transit Regulation.

130. Paragraphs 1-49, 125 and 126 are incorporated herein by reference and pleaded as if fully set forth.

131. Defendants have failed to provide adequate interim mitigation required in the Transit Regulation to offset the air quality impacts caused by delay in completion of the Old Colony Greenbush Line, which has been delayed more than three years beyond the deadline in the Transit Regulation.

132. The Transit Regulation requires that the Old Colony Greenbush Line be complete by December 31, 1996. This project still has not been completed.

133. The failure to provide interim mitigation to offset the more than three-year delay in completion of the Old Colony Greenbush Line after the deadline in the Transit Regulation is a violation of an emission standard or limitation in effect under the SIP and constitutes a continuing violation of the CAA.

COUNT FIFTEEN: Defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to provide adequate interim mitigation for delay in Restoration of the Arborway Line as required by the Transit Regulation.

134. Paragraphs 1-49, 125 and 126 are incorporated herein by reference and pleaded as if fully set forth.

135. Defendants have failed to provide adequate interim mitigation required in the Transit Regulation to offset the air quality impacts caused by delay in restoration of

the Arborway Line, which has been delayed more than three years beyond the deadline in the Transit Regulation.

136. The Transit Regulation requires that Arborway Restoration be complete by December 31, 1997. This project still has not been completed.

137. The failure to provide interim mitigation to offset the more than three-year delay in completion of Arborway Restoration after the deadline in the Transit Regulation is a violation of an emission standard or limitation in effect under the SIP and constitutes a continuing violation of the CAA.

COUNT SIXTEEN: In the alternative, to the extent that the ACO and amended ACOs modify the enforceable emission standards or limitations in effect under the SIP in the Transit Regulation, defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to restore the Arborway Line or provide a schedule of completion for the Arborway Line.

138. Paragraphs 1-49 are incorporated herein by reference and pleaded as if fully set forth.

139. In the alternative, if the ACO, Amended ACO or Second Amended ACO operate to modify, change, or otherwise amend the Massachusetts SIP such that the specific requirements and commitments set forth in the ACOs represent emission standards or limitations in effect under the CAA or the SIP, defendants are in violation of those provisions as well.

140. The ACO requires that defendants provide a schedule for the completion of the Arborway Restoration project, including benchmarks, milestones and action items.

141. The failure of defendants to provide a schedule of completion as required by the ACO is a violation of an enforceable emission standard or limitation in effect under the SIP and is a continuing violation of the CAA.

COUNT SEVENTEEN: In the alternative, to the extent that the ACO and amended ACOs modify the enforceable emission standards or limitations in effect under the SIP in the Transit Regulation and Vent Stack Permit, defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to complete or take substantial steps to complete Rail Service to T.F. Green Airport.

142. Paragraphs 1-49 and 139 are incorporated herein by reference and pleaded as if fully set forth.

143. Defendants have failed to complete Rail Service to T.F. Green Airport in Rhode Island, a project identified in the ACO to provide interim mitigation for delay in completion of requirements of the Transit Regulation and Vent Stack Permit. No substantial steps have been taken to complete this interim mitigation project.

144. The failure of defendants to complete rail service to T.F.Green Airport as required by the ACO is a violation of an enforceable emission standard or limitation in effect under the SIP and is a continuing violation of the CAA.

COUNT EIGHTEEN: In the alternative, to the extent that the ACO and amended ACOs modify the enforceable emission standards or limitations in effect under the SIP in the Transit Regulation and Vent Stack Permit, defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to promote signalization technology to give priority to mass transit vehicles in greater Boston.

145. Paragraphs 1-49 and 139 are incorporated herein by reference and pleaded as if fully set forth.

146. Defendants have failed to promote signalization technology to give priority to mass transit vehicles in Greater Boston, a project identified in the ACO to provide interim mitigation for delay in completion of requirements of the Transit Regulation and Vent Stack Permit. No substantial steps have been taken to complete this interim mitigation project.

147. The failure of defendants to promote signalization technology as required by the ACO is a violation of an enforceable emission standard or limitation in effect under the SIP and is a continuing violation of the CAA.

COUNT NINETEEN: In the alternative, to the extent that the ACO and amended ACOs modify the enforceable emission standards or limitations in effect under the SIP in the Transit Regulation and Vent Stack Permit, defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to secure federal funding for Silver Line Phase III or provide an alternative urban transit investment.

148. Paragraphs 1-49 and 139 are incorporated herein by reference and pleaded as if fully set forth.

149. As an interim mitigation for delay in completion of requirements of the Transit Regulation and Vent Stack Permit, the ACO requires that federal funding be secured for Silver Line Phase III and provides that if such funding is not secured by 2005, an alternative urban transit investment must be undertaken annually.

150. Federal funding has not been secured for Silver Line Phase III, and no urban transit investment has been identified or undertaken to address this failure.

151. Defendants' failure to secure federal funding by December 31, 2004 or identify and undertake an alternative urban transit investment as required by the ACO is a violation of an enforceable emission standard or limitation in effect under the SIP and is a continuing violation of the CAA.

COUNT TWENTY: In the alternative, to the extent that the ACO and amended ACOs modify the enforceable emission standards or limitations in effect under the SIP in the Transit Regulation and Vent Stack Permit, defendants are in violation of an enforceable emission standard or limitation in effect under the SIP for failure to prioritize for funding the projects contained in the ACO.

152. Paragraphs 1-49 and 139 are incorporated herein by reference and pleaded as if fully set forth.

153. Defendants have failed to prioritize the commitments contained in the ACO for funding, a measure identified in the ACO to provide interim mitigation for delay in completion of requirements of the Transit Regulation and Vent Stack Permit. The commitments in the ACO have not all been prioritized for funding.

154. Defendants' failure to prioritize the commitments contained in the ACO as required by the ACO is a violation of an enforceable emission standard or limitation in effect under the SIP and is a continuing violation of the CAA.

WHEREFORE, the plaintiffs respectfully request the Court to:

1. Adjudge and declare that the defendants individually and collectively have violated and continue to violate the Clean Air Act due to their failure to carry out their respective obligations and responsibilities to implement and complete emission standards and limitations in the Massachusetts SIP according to its terms.

2. Enter a preliminary and permanent injunction establishing a specific, detailed and enforceable timetable for defendants to comply with all applicable emission standards and limitations in the Massachusetts SIP.

3. Order the defendants to pay appropriate civil penalties pursuant to 42 U.S.C. § 7604(a).

4. Retain jurisdiction over this matter until such time as defendants have fully complied with their duties, obligations and commitments under Massachusetts' SIP and the Clean Air Act with respect to the transportation projects required pursuant to the Transit Regulation and the Vent Stack Permit.

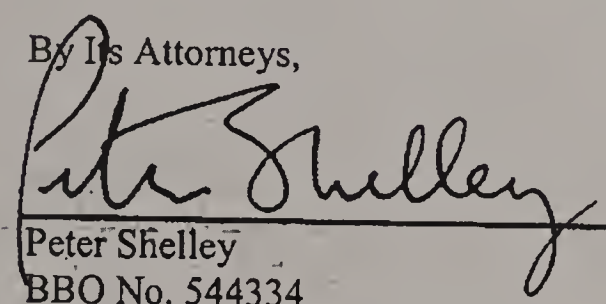
5. Award Conservation Law Foundation its costs of litigation, including reasonable attorneys' and expert witness fees.

6. Grant Conservation Law Foundation such further and additional relief as the Court may deem just and proper.

Respectfully submitted on this 14th day of March, 2005.

CONSERVATION LAW FOUNDATION, INC.,
Plaintiff,

By Its Attorneys,



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https://www.workbar.com/posts/us2-and-workbar-announce-partnership-to-offer-shared-coworking-space

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US2 And Workbar Announce Partnership To Offer Shared Coworking Space

Photo by Tiffany Knight

Union Square Station Associates (US2), the City's master developer partner for Union Square's revitalization, and Boston-based coworking space network Workbar announced today that they have partnered to bring their membership-based coworking network to Union Square.

The US2-Workbar partnership will operate a shared workspace at 31 Union Square, the former home of Elegant Furniture which closed last fall and has been vacant since. For its local headquarters, US2 will locate its offices within the coworking space. US2 announced in March that the 2,500 square foot ground floor space will be staffed by a full-time US2 representative who will be available to field questions and provide general information about the Union Square revitalization, and will serve as a central hub for the recruitment of office tenants to fill commercial space in the new development.

"US2 is pleased to partner with Workbar to provide real value to the neighborhood's start-ups, entrepreneurs, creative community and professionals," said Greg Karczewski, president of US2. "Workbar is a homegrown company that has a strong reputation for building community both inside and outside its walls. Our partnership is an innovative way to bring more vitality and commerce to Union Square and jumpstart its revitalization, helping both new and existing businesses."

The partnership will provide Somerville residents with access to shared workspace, conference and meeting rooms, event space, fast and secure wi-fi, and other common office amenities. Workbar also offers a wide variety of social and educational programming including lunch seminars, workshops, networking events and happy hours.

Made up of thriving start-ups, creative entrepreneurs, independent professionals, and enterprise teams, the interactive and collaborative atmosphere of Workbar gives members access to all of the resources their businesses need to grow. Members enjoy a motivating and productive work

environment and a strong network of friendship and support from a vibrant community full of professional and social connections ready and willing to help each other build, create, and grow.

"Our partnership with US2 will allow us to extend the Workbar Network of coworking spaces to Somerville, providing local startups, small businesses and remote professionals the ability to grow their enterprises and collaborate with other entrepreneurs," said Bill Jacobson, Founder & CEO of Workbar.

"The innovative partnership between US2 and Workbar is a promising development for Union Square, and is a serious step toward fulfilling our community's vision of the neighborhood as an employment center that will attract innovation jobs and spur our local economy," said Steve Mackey, president of the Somerville Chamber of Commerce.

Workbar currently has locations in Boston and Cambridge and a network of partner spaces across Eastern Massachusetts. It serves over 800 members from more than 400 different businesses. US2 and Workbar expect to open the new Union Square facility this summer. Learn more about Workbar Union by visiting http://info.workbar.com/union.

ABOUT US2:

Union Square Station Associates (US2) is the City of Somerville's master developer partner for the state-approved Union Square Revitalization Project that includes over 15 acres of redevelopment near the future Union Square MBTA Green Line Station. US2 is collaborating with the community to create a vital and viable redevelopment plan for Union Square that realizes the community objectives as laid out in Somerville's long-term plan, SomerVision. These objectives include making Union Square into a destination for employers, creating public green space, achieving housing goals with a range of affordability, and preserving the historical character and authenticity that everybody loves today.

For more information on US2, visit www.us2unionsquare.com, or follow us on Twitter at @us2unionsquare and on Facebook.

ABOUT WORKBAR:

Workbar is a network of shared, coworking office spaces for all business types—including startups, independent professionals, small businesses, and remote teams from large enterprises. Along with a productive work environment, Workbar fosters a vibrant community ready and willing to help each other build, create, and grow their businesses. Started in 2009, Workbar has grown its Network to 25+ sites and over 800 members from 250+ different companies.

For more information on Workbar, visit www.workbar.com, or follow us on Twitter at @workbar and on Facebook.

workbar

Previous

Summer Lovin: Craft Beer in Boston

June 18, 2015

Next

5 Big Branding Questions Your Company Should be Asking Itself

June 9, 2015

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Office Spaces

Workbar Cambridge
Coworking Spaces
Office Spaces

Workbar South Station
Coworking Spaces
Office Spaces

Workbar Union Square
Coworking Spaces
Office Spaces

Workbar Arlington
Coworking Spaces
Office Spaces

Workbar Brighton
Coworking Spaces
Office Spaces

Workbar Danvers
Coworking Spaces
Office Spaces

Workbar Norwood
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SCM.1 Property transfer.

The SRA and Union Square Station Associates LLC, following its designation as master developer for the revitalization of Union Square, memorialized that designation by entering into the Master Land Disposition Agreement dated May 2, 2017 (as amended and assigned, the "MLDA"). The MLDA contemplates that Union Square Station Associates LLC or its successor as master developer will set up separate affiliated entities for individual building or parcel developments, in order to facilitate the phased development of the Project and the financing of construction. In early 2018, Union Square Station Associates LLC requested SRA acknowledgment and consent respecting an assignment of the MLDA from Union Square Station Associates LLC to its affiliate, as contemplated by the MLDA, and following such consent the MLDA and other permits related to the Project were assigned to that affiliated entity, Union Square RELP Master Developer LLC. This assignment was formally acknowledged by the SRA pursuant to an Estoppel Certificate and Acknowledgment dated March 1, 2018, approved at a public SRA board meeting. The assignment was completed pursuant to an Assignment and Assumption of Amended and Restated Master Developer Designation Agreement, Master Land Disposition Agreement, Development Covenant and CDSP dated March 16, 2018 by and between Union Square Station Associates LLC and its affiliate Union Square RELP Master Developer LLC.

SCM.2 Air quality analysis.

An air quality analysis consistent with MassDEP's request was included in Chapter 5 of the DEIR.

SCM.3 Sewer and wastewater infrastructure.

Section 10.1 of the DEIR provided a description of the existing and proposed sewer and wastewater infrastructure. The City's $63 million Somerville Avenue Utility and Streetscape Improvements project is currently under construction and includes a box culvert that will provide 800,000 gallons of stormwater storage to mitigate neighborhood flooding. This project represents a significant investment for the long-term goal of separating combined sewer throughout the City as it will ultimately provide stormwater conveyance to the MBTA drainage system. In the short term, the storage provided by the box culvert will also help reduce combined sewer overflows at Prison Point as it provides new in-system storage.

In addition to the sewer separation described above, the City is also completing a manhole sealing program throughout the City that will reduce infiltration by an estimated 120,000 gpd. The City is currently conducting pipeline investigations to identify additional infiltration reduction opportunities.

#15889

Dear Secretary Beaton,

I am a resident of the Union Square neighborhood in Somerville, MA, and I am writing to you today to urge you to reject US2's MEPA waiver request for the Union Square D-2 Parcel. As you may be aware, Union Square is currently undergoing a major redevelopment which was approved by MEPA 5 years ago in 2013. Since then, there have been significant changes to the scope of the development which the developer has proposed based on feedback from local residents. I believe the environmental considerations of this major redevelopment must be considered based on their current plans, not on the original, outdated plans. BCH.1

Thank you,
Brendan C Harris
106 Concord Avenue
Somerville, MA

RECEIVED
JUL 16 2018
MEPA

BRENDAN C. HARRIS

BCH.1 **Review based on updated project plans.**

The DEIR included analysis of environmental impacts related to the current Project plans. The current Project is consistent with the CDSP approved by the Planning Board as described in Section 1.2.3 of the FEIR.

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AUG 10 2018
MEPA

August 8, 2018

Dear Secretary Beaton -

I am writing to request that you deny the waiver submitted by Union Square developer USQ (EEA-15089) for Phase I of the Union Square Redevelopment Project.

In terms of Traffic + Parking too many parking spaces are proposed. Traffic is already backed up to the next traffic light on Prospect + Webster Streets. Air pollution will increase a lot exponentially.

GWH.1

Thank you,

Gregory W. Hill
24 Walnut Street
Somerville MA 02143

GWH.1 **Parking spaces.**

Section 4.5.6 of the DEIR described the proposed parking supply and management for the Project established following the Union Square Neighborhood Plan and recent zoning. The Project seeks to provide parking that serves the proposed development and adjacent neighborhood without incentivizing driving, and that is as efficiently utilized as possible in order to meet the goals of the Union Square Neighborhood Plan.

As described in Section 2.3 of the FEIR, the basis of the parking demand model used by US2 to evaluate the shared parking strategy described in the DEIR is the City's parking demand estimator which was used to estimate potential parking demand for the Project based on the proposed program of office/lab, retail, hotel, and residential uses.

The Project is required by the City to adhere to the shared parking strategy that was agreed to with the City through the Project's CDSP. The DSPR for each Lot must demonstrate adherence to the overall parking management policy developed, including sharing parking in one facility amongst the multiple uses in the specified Blocks. In addition, the zoning for the Project site and the CDSP were both developed with an overall cap on parking supply to minimize the attractiveness of driving and support the multi-modal transportation goals outlined in the Union Square Neighborhood Plan.

Also, Chapter 4 of the DEIR included a motor vehicle analysis (Section 4.5.5) as well as measures that the Project will implement to minimize vehicle trips (Sections 4.5.7 and 4.5.8).

GWH.2 **Traffic and air pollution.**

US2 is committed to minimizing vehicle use by maintaining a robust transportation demand management program to achieve the 60% non-vehicle mode share defined in the DEIR, agreed to in the approved CDSP and its existing MMP, and consistent with recent zoning, *SomerVision*, and the Union Square Neighborhood Plan.

Chapter 4 of the DEIR included a motor vehicle analysis (Section 4.5.5) as well as measures that the Project will implement to minimize vehicle trips (Sections 4.5.7 and 4.5.8).

In combination with proposed pedestrian and bicycle improvements, close proximity to public transit services, and inherent walkable characteristics of the Union Square neighborhood, the Project has been developed consistent with area goals and guidelines to take advantage of, promote and maximize non-auto travel. Pedestrian prioritization is a foundational element of the plan that will seek to greatly enhance the neighborhood streetscape through connectivity to public realm improvements and new civic open

spaces. These efforts in turn will minimize the air quality impacts related to vehicle trips. To further reduce vehicle emissions, the Project will include 72 preferred parking spaces for low emitting/fuel efficient vehicles, 29 carpool spaces during the weekday, 38 electric vehicle charging parking spaces, 38 electric vehicle ready parking spaces, and 14 spaces for car sharing services.

Included in Chapter 5 of the FEIR is an overview of the programs and commitments of the Project towards meeting these goals.

RECEIVED

AUG 10 2018

MEPA

Dear Secretary Matthew Beaton,

I am a resident of Somerville and someone who has worked in Union Square. I have friends and acquaintances who live in Union Square.

I am writing to urge you to deny USQ's request for a waiver for Phase 1 of the Union Square Redevelopment Project (EEA #15889) for several reasons.

Regarding traffic and parking: there is already significant traffic backup in Union Square. Adding 300 new parking spaces in Phase 1 will only add to this problem and will extend into other areas beyond the boundaries of Phase 1/the D2 site. More traffic means greater air pollution. A full environmental review with more comprehensive data on the effects of this increase in traffic is imperative. We deserve breatheable air in Union Square. M1.1

Regarding flooding: the current storm and wastewater infrastructure in Union Square is insufficient even though the developer claims otherwise. We know this because local businesses (ex. SCATV) flood every time there is a big storm. The City of Somerville has responded to this problem through a largely State-funded pipe redevelopment project to reroute pipes so that stormwater and wastewater no longer flow through the same pipes. However, ML.2

this project is ongoing and without a full environmental review there will be no way to know whether these changes will be enough to account for the massive increase in wastewater production that will be brought about by Phase 1 of the development. Furthermore, Phase 1 will greatly increase the amount of impervious surface area on the D2 site which will likely increase storm water runoff as well.

Regarding land contamination: there is significant soil contamination on the Phase 1 site. There has been some cleanup and the developer plans to do more, but will not remove all contaminated soil, rather "capping" contaminated areas with concrete. This is dangerous because Union Square is in a flood plain and the contaminated soil under these "caps" can be carried into "uncapped" areas, whether in or beyond the Phase 1 site. Exposure to contaminated soil can have serious chronic health repurcussions. Capping is simply an unacceptable solution to contamination, unless a full environmental review can prove otherwise. We deserve a healthy and safe environment in Union Square. ML.3

Thank you for considering my concerns. I hope that you will deny US2's request for a Phase 1 waiver.

Sincerely,

Mia Lambert, Somerville resident

ML.1 Traffic and related air pollution.

US2 is committed to minimizing vehicle use by maintaining a robust transportation demand management program to achieve the 60% non-vehicle mode share defined in the DEIR, agreed to in the approved CDSP and its existing MMP, and consistent with recent zoning, *SomerVision*, and the Union Square Neighborhood Plan.

Chapter 4 of the DEIR included a motor vehicle analysis (Section 4.5.5) as well as measures that the Project will implement to minimize vehicle trips (Sections 4.5.7 and 4.5.8).

In combination with proposed pedestrian and bicycle improvements, close proximity to public transit services, and inherent walkable characteristics of the Union Square neighborhood, the Project has been developed consistent with area goals and guidelines to take advantage of, promote and maximize non-auto travel. Pedestrian prioritization is a foundational element of the plan that will seek to greatly enhance the neighborhood streetscape through connectivity to public realm improvements and new civic open spaces. These efforts in turn will minimize the air quality impacts related to vehicle trips. To further reduce vehicle emissions, the Project will include 72 preferred parking spaces for low emitting/fuel efficient vehicles, 29 carpool spaces during the weekday, 38 electric vehicle charging parking spaces, 38 electric vehicle ready parking spaces, and 14 spaces for car sharing services.

Included in Chapter 5 of the FEIR is an overview of the programs and commitments of the Project towards meeting these goals.

ML.2 Area flooding.

Chapter 9 of the DEIR provided information about existing and proposed storm drain infrastructure, as well as stormwater management. Lastly, Section 1.2.2, page 1-24 of the DEIR, Streetscape and Infrastructure Improvements, included additional details about the City's expansion of neighborhood stormwater infrastructure and the Project's contributions to that effort.

Stormwater management facilities will be implemented on a Lot-by-Lot basis and will conform to all Stormwater Management Standards within the Massachusetts Stormwater Handbook to the maximum extent practicable. These on-site mitigation measures will decrease the peak rate of runoff for all storm events up to and including the 100-year storm event. By doing so, these on-site measures will provide relief to the existing (and proposed) City infrastructure that currently experiences surcharge and flooding during large scale storm events.

The Project will include a number of additional low impact development measures, where feasible and practicable. Residential buildings are anticipated to incorporate both blue and green roof technology to temporarily store stormwater, combined with rain water harvesting for irrigation. Permeable pavement will be substituted for traditional asphalt pavement in areas to promote infiltration and groundwater recharge. Additionally, rain gardens will be constructed in pervious areas to promote water quality treatment and groundwater recharge.

ML.3 Capping contaminated soils.

Chapter 8 of the DEIR discussed the anticipated approaches to achieve a level of No Significant Risk on applicable sites. As discussed in Section 8.10, in certain instances installation of protective barriers may be used to cap contaminated soil. This is a very common practice in Massachusetts and is consistent with the provisions and regulations outlined under the MCP. Protective barriers allow residually impacted soils to remain in place, as opposed to having to over excavate and replace, while limiting exposures to these materials. Caps will be constructed such that they are not susceptible to erosion.

For each Lot, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. In certain instances, installation of protective barriers may be used to cap contaminated soil. In such instances, the barrier will be separated from the underlying layers by a geotextile or other similar material to provide a visual marker and to separate the upper clean materials from the lower contaminated soil. In paved or hardscaped areas, the barrier will be a minimum of one-foot thick consisting of clean soil, base material and the pavement or concrete surface finish. Use of protective barriers to achieve and maintain a level of No Significant Risk will require the recording of an AUL that demonstrates where the barriers are located and describes the required maintenance of the barrier. In cases where existing AULs are present, construction will be performed in a manner that is consistent with the AULs.

As part of redevelopment design plans, US2 will be designing and constructing stormwater collection and detention systems to accommodate the 100-year storm event, thereby mitigating potential flooding. In addition, the inclusion of protective barriers will be incorporated in the remediation plans for the Project, where required by the MCP and the federal Toxic Substances Control Act (TSCA). The protective barriers will likely consist of a combination of concrete slabs (for proposed buildings), pavement/hardscaping, and/or three feet of clean soil cover in landscaped areas. As required by the MCP, the site areas will be assessed and remediated, where necessary, to meet the applicable regulatory criteria to show a Condition of No Significant Risk to human health, safety, public welfare, and the environment. This will include demonstration that response actions have assessed and controlled the subsurface migration of contamination remaining at the site.

RECEIVED
AUG 10 2018
MEPA

Somerville, August 13, 2018 -

Dear Secretary
Matthew BEATON

I'm very worry for the waiver requested by US2 to the UNION Square redevelopment Project (EEA# 15889).
Please, considere to:
deny waiver for phase 1

- Too many parking spaces proposed JA.1
- Air pollution will increased potentially
- Soil contamination JA.2
- Plan to control hazardous soil pollution means ("CAP")
- Some contamination will remain for long time
- capped contaminated soil
is especally dangerous in:
a Flood plain like Union Sq.

More testing (Soil)
to show that Water Table is NOT moving in direction that would bring contaminants into open spaces (used by children and elders)
Open Spaces - no asfalt or concrete - green permeable JA.3
Thank you, Mr. secretary for your attention.
Jacinta Arena

JA.1 **Parking spaces and air pollution.**

Section 4.5.6 of the DEIR described the proposed parking supply and management for the Project established following the Union Square Neighborhood Plan and recent zoning. The Project seeks to provide parking that serves the proposed development and adjacent neighborhood without incentivizing driving, and that is as efficiently utilized as possible in order to meet the goals of the Union Square Neighborhood Plan.

As described in Section 2.3 of the FEIR, the basis of the parking demand model used by US2 to evaluate the shared parking strategy described in the DEIR is the City's parking demand estimator which was used to estimate potential parking demand for the Project based on the proposed program of office/lab, retail, hotel, and residential uses.

The Project is required by the City to adhere to the shared parking strategy that was agreed to with the City through the Project's CDSP. The DSPR for each Lot must demonstrate adherence to the overall parking management policy developed, including sharing parking in one facility amongst the multiple uses in the specified Blocks. In addition, the zoning for the Project site and the CDSP were both developed with an overall cap on parking supply to minimize the attractiveness of driving and support the multi-modal transportation goals outlined in the Union Square Neighborhood Plan.

The DEIR included an unshared parking analysis that was completed using the ITE Parking Generation manual, 4th edition. A summary of this analysis was included in Appendix B-8 of the DEIR, and shows that the potential demand if parking were unshared and not managed as described in the DEIR, could be over 4,800 parking spaces. The parking ratios proposed for the Project are below transportation industry standards.

In regard to air pollution, US2 is committed to minimizing vehicle use by maintaining a robust transportation demand management program to achieve the 60% non-vehicle mode share defined in the DEIR, agreed to in the approved CDSP and its existing MMP, and consistent with recent zoning, *SomerVision*, and the Union Square Neighborhood Plan. Achieving this goal is will minimize the air quality impacts related to Project-generated vehicle trips. To further reduce vehicle emissions, the Project will include 72 preferred parking spaces for low emitting/fuel efficient vehicles, 29 carpool spaces during the weekday, 38 electric vehicle charging parking spaces, 38 electric vehicle ready parking spaces, and 14 spaces for car sharing services.

JA.2 Contaminated soil.

Chapter 8 of the DEIR discusses the anticipated approaches to achieve a level of No Significant Risk on applicable sites. Specifically, the assessment and remediation approaches are outlined for each Block in the following sections: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7 Block: 8.8.3. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. For each Lot, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. In certain instances, installation of protective barriers may be used to cap contaminated soil. In such instances, the barrier will be separated from the underlying layers by a geotextile or other similar material to provide a visual marker and to separate the upper clean materials from the lower contaminated soil. In paved or hardscaped areas, the barrier will be a minimum of one-foot thick consisting of clean soil, base material and the pavement or concrete surface finish. Use of protective barriers to achieve and maintain a level of No Significant Risk will require the recording of an AUL that demonstrates where the barriers are located and describes the required maintenance of the barrier. In cases where existing AULs are present, construction will be performed in a manner that is consistent with the AULs.

JA.3 Open space.

The Union Square Overlay District Zoning was adopted to codify the Neighborhood Plan targets and requires US2 to create more open space and public realm (25%) than what was recommended by the Union Square Neighborhood Plan (15%). As part of the open space and public realm improvements, the approved plan will deliver over 2.5 acres of new, public civic open spaces (see Section 1.2.4.4 of the FEIR for details about the proposed civic open spaces).

The Mayor's Office of Strategic Planning & Community Development in Somerville recently developed a new system for planning and regulating the creation of public spaces within Somerville. To create this system, planners identified the characteristics that make spaces different from one another, and then built a typological menu of spaces that meet unique community needs. These special spaces were called 'Civic Spaces' (referred to herein as "civic open spaces"), named to reflect the important civic role that public spaces play in community building. Together, these civic open space types accommodate different needs in different ways, providing a flexible system to not only ensure that high-quality design would govern their delivery, but to also provide a tool to calibrate unique space types to unique locations, remaining responsive to an area's users and specific needs. To do this, each civic open space type has a unique set

of design standards that guide certain qualities and parameters of the type, including the dimensions of the lot, the seating and tables to be provided, the quantity of tree planting and other planted surfaces, as well as the overall percentage of perviousness of the site. Overall, the civic open space requirements reflect the desire for permeable surfaces, substantial planting and significant tree canopy prioritized by the community.

RECEIVED
AUG 10 2018
MEPA

August 9, 2018

Dear Secretary Matthew Beaton,

I am writing to ask you to deny the waiver for phase 1 of Union Square Redevelopment Project [EEA # 15889]

The current infrastructure for storm water and sewage can't handle additional loads. VZ.1

Traffic is already backed up and additional cars will increase air pollution exponentially. VZ.2

Plan to cap hazardous soil pollution means some soil will remain for a very long time. Contaminated soil is dangerous in a flood plain like Union Square. More soil testing needs to be done. VZ.3

Thank you,

Valerie Zinkus
56 Wheatland St #3
Somerville, MA 02145

VZ.1 Infrastructure.

The design of the site, landscape, and stormwater management systems for D1 through D7 will include appropriate measures to infiltrate stormwater where feasible, detain stormwater, and reduce the peak runoff rates after construction. The stormwater system will be designed Lot-by-Lot with each in compliance with the MassDEP Stormwater Management Standards to the maximum extent practicable. Each Lot will include stormwater management measures to mitigate peak rates of runoff, water quality measures, and detention/infiltration facilities, as is feasible and practicable, in accordance with the Massachusetts Stormwater Management standards to the maximum extent practicable.

Stormwater detention and infiltration facilities, where feasible and practicable, will be incorporated into the design of each Lot to reduce the rate and volume of stormwater discharged from the development for all storm events up to and including the 100-year storm event. Reducing the rate and volume of stormwater discharge will reduce the demands on the existing infrastructure and will help reduce the extent and duration of surcharging in the City's infrastructure during intense storm events.

Currently, the Proponent does not have ownership of the remainder of the parcels and cannot legally access them to perform investigations of subsurface conditions. Upon acquiring each parcel, investigations will be performed to determine soil conditions and groundwater elevations that will allow pre-development hydrology analyses and for the design of appropriate stormwater management systems that will reduce peak rates of runoff and runoff volumes, if feasible.

The reduction in peak runoff rates from each Lot will benefit the local stormwater infrastructure. The City's installation of the 14-foot by 6-foot box culvert adjacent to D1, D2 and D6 in Somerville Avenue represents a significant improvement in the ability of the City's infrastructure to store stormwater and reduce the magnitude and extent of surcharging events in the Union Square area.

VZ.2 Traffic.

US2 is committed to minimizing vehicle use by maintaining a robust transportation demand management program to achieve the 60% non-vehicle mode share defined in the DEIR, agreed to in the approved CDSP and its existing MMP, and consistent with recent zoning, *SomerVision*, and the Union Square Neighborhood Plan.

Chapter 4 of the DEIR included a motor vehicle analysis (Section 4.5.5) as well as measures that the Project will implement to minimize vehicle trips (Sections 4.5.7 and 4.5.8).

In combination with proposed pedestrian and bicycle improvements, close proximity to public transit services, and inherent walkable characteristics of the Union Square neighborhood, the Project has been developed consistent with area goals and guidelines to take advantage of, promote and maximize non-auto travel. Pedestrian prioritization is a foundational element of the plan that will seek to greatly énhance the neighborhood streetscape through connectivity to public realm improvements and new civic open spaces. These efforts in turn will minimize the air quality impacts related to vehicle trips. To further reduce vehicle emissions, the Project will include 72 preferred parking spaces for low emitting/fuel efficient vehicles, 29 carpool spaces during the weekday, 38 electric vehicle charging parking spaces, 38 electric vehicle ready parking spaces, and 14 spaces for car sharing services.

Included in Chapter 5 of the FEIR is an overview of the programs and commitments of the Project towards meeting these goals.

VZ.3 Contaminated soil.

Chapter 8 of the DEIR includes information regarding site conditions and plans to achieve a level of No Significant Risk. Specifically, the assessment and remediation approaches are outlined for each Block in the following sections: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7 Block: 8.8.3. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. For each Lot, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. In certain instances, installation of protective barriers may be used to cap contaminated soil. In such instances, the barrier will be separated from the underlying layers by a geotextile or other similar material to provide a visual marker and to separate the upper clean materials from the lower contaminated soil. In paved or hardscaped areas, the barrier will be a minimum of one-foot thick consisting of clean soil, base material and the pavement or concrete surface finish. Use of protective barriers to achieve and maintain a level of No Significant Risk will require the recording of an AUL that demonstrates where the barriers are located and describes the required maintenance of the barrier. In cases where existing AULs are present, construction will be performed in a manner that is consistent with the AULs.

RECEIVED
AUG 13 2018
MEPA

August 8, 2018

Dear Secretary Beaton,

I am writing to urge you to reject USZ's application for a waiver of the full study for Phase 1, D2 of their Somerville Union Square Project (EEA 15887).

I am especially concerned that the infrastructure is inadequate to support Phase 1. The D2 site is significantly contaminated, and being in an area that frequently floods is especially dangerous. Union Square buildings especially are in a flood plain and basements flood frequently. (I will enclose a photo of a flooded basement in the Somerville Media Center at 90 Union Square (directly across Somerville Ave from D2) on July 27, 2018.

MJC.1

Somerville children already have a high rate of asthma, which is

exacerbated by exposure to mold that grows in damp areas such as Union Square. It is also worsened by exposure to auto pollution, which will increase until the Phase One plan, which has many more parking spaces planned in 5 new garages.

As a resident, I have many other concerns about the environmental impact of this project, but the most serious are outlined above. The project also doesn't propose much remediation or design features that would offset these problems; for example open space, permeable surfaces.

Thank you for considering my concerns and denying this waiver.

Sincerely,
Mary O. Connelly
36 Marshall St.
Somerville, MA 02145

MJC.2

MJC.1 Infrastructure.

The design of the site, landscape, and stormwater management systems for D1 through D7 will include appropriate measures to infiltrate stormwater where feasible, detain stormwater, and reduce the peak runoff rates after construction. The stormwater system will be designed Lot-by-Lot with each in compliance with the MassDEP Stormwater Management Standards to the maximum extent practicable. Each Lot will include stormwater management measures to mitigate peak rates of runoff, water quality measures, and detention/infiltration facilities, as is feasible and practicable, in accordance with the Massachusetts Stormwater Management standards to the maximum extent practicable.

Stormwater detention and infiltration facilities, where feasible and practicable, will be incorporated into the design of each Lot to reduce the rate and volume of stormwater discharged from the development for all storms up to and including the 100-year storm event. Reducing the rate and volume of stormwater discharge will reduce the demands on the existing infrastructure and will help reduce the extent and duration of surcharging in the City's infrastructure during intense storm events.

Currently, the Proponent does not have ownership of the remainder of the parcels and cannot legally access them to perform investigations of subsurface conditions. Upon acquiring each parcel, investigations will be performed to determine soil conditions and groundwater elevations that will allow pre-development hydrology analyses and for the design of appropriate stormwater management systems that will reduce peak rates of runoff and runoff volumes, if feasible.

The reduction in peak runoff rates from each Lot will benefit the local stormwater infrastructure. The City's installation of the 14-foot by 6-foot box culvert adjacent to D1, D2 and D6 in Somerville Avenue represents a significant improvement in the ability of the City's infrastructure to store stormwater and reduce the magnitude and extent of surcharging events in the Union Square area.

MJC.2 Contaminated soil.

Chapter 8 of the DEIR discusses the anticipated approaches to achieve a level of No Significant Risk on applicable sites. Specifically, the assessment and remediation approaches are outlined for each Block in the following sections: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7 Block: 8.8.3. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. For each Lot, a specific strategy will be

developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. In certain instances, installation of protective barriers may be used to cap contaminated soil. In such instances, the barrier will be separated from the underlying layers by a geotextile or other similar material to provide a visual marker and to separate the upper clean materials from the lower contaminated soil. In paved or hardscaped areas, the barrier will be a minimum of one-foot thick consisting of clean soil, base material and the pavement or concrete surface finish. Use of protective barriers to achieve and maintain a level of No Significant Risk will require the recording of an AUL that demonstrates where the barriers are located and describes the required maintenance of the barrier. In cases where existing AULs are present, construction will be performed in a manner that is consistent with the AULs.

10 August 2018

RECEIVED
AUG 15 2018
MEPA

Dear Secretary Beaton,

I write urging you to deny the waiver that USZ applied for, EEA #15889, in Union Square, Somerville, for Phase 1 of Union Sq. redevelopment project, DZ.

The potential environmental impacts from Phase 1, taken alone, are significant. For starters, the plan to "cap" hazardous soil pollution means some contamination will remain for a long time. This is especially alarming in a flood plain like Union Square. A big unknown are chronic exposure repercussions with any contamination. More soil testing must be required. PT.1

At 300, too many parking spaces are proposed. PT.2 Traffic is already significant, PT.3 backed up to the light at Webster and Prospect. Air pollution will increase. It's raining as I write, in Union Sq. we have flood warnings. The current infrastructure for storm water and sewage cannot handle additional loads brought on by Phase 1. One element that lessons the load of flooding is permeability— PT.4 and there are insufficient permeable surfaces in Phase 1. Green space is not asphalt, turf or concrete, but permeable grass, flowers, gravel, trees.

Please deny this waiver.

Sincerely,

Penelope Taylor
8 Quincy St #2
Somerville 02143
penelope.a.taylor@gmail.com

PT.1 Contaminated soil.

Chapter 8 of the DEIR discusses the anticipated approaches to achieve a level of No Significant Risk on applicable sites. Specifically, the assessment and remediation approaches are outlined for each Block in the following sections: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7 Block: 8.8.3. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. For each Lot, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. In certain instances, installation of protective barriers may be used to cap contaminated soil. In such instances, the barrier will be separated from the underlying layers by a geotextile or other similar material to provide a visual marker and to separate the upper clean materials from the lower contaminated soil. In paved or hardscaped areas, the barrier will be a minimum of one-foot thick consisting of clean soil, base material and the pavement or concrete surface finish. Use of protective barriers to achieve and maintain a level of No Significant Risk will require the recording of an AUL that demonstrates where the barriers are located and describes the required maintenance of the barrier. In cases where existing AULs are present, construction will be performed in a manner that is consistent with the AULs.

PT.2 Parking spaces.

Section 4.5.6 of the DEIR described the proposed parking supply and management for the Project established following the Union Square Neighborhood Plan and recent zoning. The Project seeks to provide parking that serves the proposed development and adjacent neighborhood without incentivizing driving, and that is as efficiently utilized as possible in order to meet the goals of the Union Square Neighborhood Plan.

As described in Section 2.3 of the FEIR, the basis of the parking demand model used by US2 to evaluate the shared parking strategy described in the DEIR is the City's parking demand estimator which was used to estimate potential parking demand for the Project based on the proposed program of office/lab, retail, hotel, and residential uses.

The Project is required by the City to adhere to the shared parking strategy that was agreed to with the City through the Project's CDSP. The DSPR for each Lot must demonstrate adherence to the overall parking management policy developed, including sharing parking in one facility amongst the multiple uses in the specified Blocks. In addition, the zoning for the Project site and the CDSP were both developed with an overall cap on parking supply to minimize the attractiveness of driving and support the multi-modal transportation goals outlined in the Union Square Neighborhood Plan.

Also, Chapter 4 of the DEIR included a motor vehicle analysis (Section 4.5.5) as well as measures that the Project will implement to minimize vehicle trips (Sections 4.5.7 and 4.5.8).

PT.3 **Traffic and air pollution.**

US2 is committed to minimizing vehicle use by maintaining a robust transportation demand management program to achieve the 60% non-vehicle mode share defined in the DEIR, agreed to in the approved CDSP and its existing MMP, and consistent with recent zoning, *SomerVision*, and the Union Square Neighborhood Plan.

Chapter 4 of the DEIR included a motor vehicle analysis (Section 4.5.5) as well as measures that the Project will implement to minimize vehicle trips (Sections 4.5.7 and 4.5.8).

In combination with proposed pedestrian and bicycle improvements, close proximity to public transit services, and inherent walkable characteristics of the Union Square neighborhood, the Project has been developed consistent with area goals and guidelines to take advantage of, promote and maximize non-auto travel. Pedestrian prioritization is a foundational element of the plan that will seek to greatly enhance the neighborhood streetscape through connectivity to public realm improvements and new civic open spaces. These efforts in turn will minimize the air quality impacts related to vehicle trips. To further reduce vehicle emissions, the Project will include 72 preferred parking spaces for low emitting/fuel efficient vehicles, 29 carpool spaces during the weekday, 38 electric vehicle charging parking spaces, 38 electric vehicle ready parking spaces, and 14 spaces for car sharing services.

Included in Chapter 5 of the FEIR is an overview of the programs and commitments of the Project towards meeting these goals.

PT.4 **Flooding.**

Chapter 9 of the DEIR provided information about existing and proposed storm drain infrastructure, as well as stormwater management. Lastly, Section 1.2.2, page 1-24 of the DEIR, Streetscape and Infrastructure Improvements, included additional details about the City's expansion of neighborhood stormwater infrastructure and the Project's contributions to that effort.

Stormwater management facilities will be implemented on a Lot-by-Lot basis and will conform to all Stormwater Management Standards within the Massachusetts Stormwater Handbook to the maximum extent practicable. These on-site mitigation measures will decrease the peak rate of runoff for all storm events up to and including the 100-year storm event. By doing so, these on-site measures will provide relief to the

existing (and proposed) City of Somerville infrastructure that currently experiences surcharge and flooding during large scale storm events.

The Project will include a number of additional low impact development measures, where feasible and practicable. Residential buildings are anticipated to incorporate both blue and green roof technology to temporarily store stormwater, combined with rain water harvesting for irrigation. Permeable pavement will be substituted for traditional asphalt pavement in areas to promote infiltration and groundwater recharge. Additionally, rain gardens will be constructed in pervious areas to promote water quality treatment and groundwater recharge.

Sandra Brown
25 Mansfield street
Somerville, Ma 02143
Apt 14

RECEIVED
AUG 15 2018
MEPA

Sunday 8, 12, 2018

Dear Secretary Matthew Beaton,

I am writing this letter urging you to decline the Phase 1 wavier for the union Square Redevelopment Project Requested by US2. The Current traffic Congestion and lack of parking space is overwhelming, stressful and unhealthly! Waiting for the walk Sign can be up to 3-5 minutes, driving from my house to our local supermarket less than a 1/2 mile away can take 30 minutes on a clear and sunny day! Air pollution is also a major concern of mine. The constan stopping and starting in traffic burn fuel at a higher rate whic i feel does contribute to air pollution. Under the union Square Redevelopment Project EEA 1589, there will be a substantially

SB.1

a overwhelming amount more traffic in union Square!!!

Secretary Beaton. I hope and pray that you will please consider the Dire Affect the phase 1 wavier will have on our community. Please do not [redacted] Grant the phase 1 Wavier that's been Requested by US2 for the EEA15559.

thank you!

Sincerely,

Jenifer Brown

SB.1 **Traffic.**

US2 is committed to minimizing vehicle use by maintaining a robust transportation demand management program to achieve the 60% non-vehicle mode share defined in the DEIR, agreed to in the approved CDSP and its existing Mobility Management Plan, and consistent with recent zoning, *SomerVision*, and the Union Square Neighborhood Plan.

Chapter 4 of the DEIR included a motor vehicle analysis (Section 4.5.5) as well as measures that the Project will implement to minimize vehicle trips (Sections 4.5.7 and 4.5.8).

In combination with proposed pedestrian and bicycle improvements, close proximity to public transit services, and inherent walkable characteristics of the Union Square neighborhood, the Project has been developed consistent with area goals and guidelines to take advantage of, promote and maximize non-auto travel. Pedestrian prioritization is a foundational element of the plan that will seek to greatly enhance the neighborhood streetscape through connectivity to public realm improvements and new civic open spaces. These efforts in turn will minimize the air quality impacts related to vehicle trips. To further reduce vehicle emissions, the Project will include 72 preferred parking spaces for low emitting/fuel efficient vehicles, 29 carpool spaces during the weekday, 38 electric vehicle charging parking spaces, 38 electric vehicle ready parking spaces, and 14 spaces for car sharing services.

Included in Chapter 5 of the FEIR is an overview of the programs and commitments of the Project towards meeting these goals.

In regard to parking, the approved Union Square Zoning Overlay District includes a carefully considered parking policy that requires a shared parking strategy, permits a maximum of 1,500 total parking spaces, and has no required parking minimum ratios. The proposed Project and its mobility management approach is responsive to this policy and includes 1,495 proposed parking spaces. The proposed parking levels are based on developing a mix of Project uses, operating shared parking facilities and the parking management strategy outlined in the DEIR. Please see Section 4.5.6 of the DEIR for more information regarding the parking plan and Section 2.5 of the FEIR for more information regarding the shared parking model.

Tuesday August 21, 2018

Matthew Beaton, Secretary

Executive Office of Energy and Environmental Affairs
Attn: MEPA Office / MEPA Analyst Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Via email to Mr. Alex Strysky

RE: ***EEA#15889, ENF, Union Square Redevelopment, Somerville MA***

Dear Secretary Beaton,

The proponent US2 and SRA are requesting a phase 1 waiver for the Union Square Redevelopment in Somerville MA. Green and Open Somerville, an environmental activist group submit our commentary below.

The importance of getting as this project right should be the main driver for the developers and the community. But since this is not always the primary concern of developers, the community needs to hold this process to account. We must be responsible to the current and future populations of Somerville. We must take our responsibilities of being attentive stewards of the land and this process seriously. We must have as much oversight as possible to create a sustainable and healthy Union Square.

Because of the impacts on climate change, the way we build now determines our survival as a species. Union Square must to ready for all the changes in weather patterns that will come and our built environment must be able to withstand this, otherwise why are we even building in this floodplain. This is a never before experienced moment in human history. Skipping steps that would reduce the number of agencies paying attention to this project, reduces our chances of getting it right. Our built environment determines our future.

Here's why US2's request for a waiver should not be granted.

Onsite pollution from traffic

GLX largest light rail investment in 60 yrs. Union Square station represents the single largest investment of a light rail single station in at least 60 yrs. The degree to which the benefits of the T station is dependent on the design and execution of development of the D2 parcel especially the public open spaces cannot be overstated.

It is clear that the initial filing is not optimal. Because D2 lies between the new station and the heart of Union Square and its revitalization, the accommodations of travel to and from the station need to be as welcoming and efficient as possible, with the public space facilitating those connections, especially parks and the plaza. In the best case there would be large public space in the center of D2 away from the noisy polluted busy streets like Prospect St. Protected open space GOS.1

in middle will be most valuable to everyone healthfully, fiscally and aesthetically. It creates an immediate sense of place.

Garages could be on the periphery or underground, but not in the middle of this development. GOS.2

SRA and US2 have had many years in which to investigate and determine the types and extents of onsite pollution. Their likely evolution in time and how best to minimize human and natural impacts from that pollution and the implications for design of the parcel have yet to be determined because we don't have that information yet. (we don't have that knowledge to derive the impact).

It is of significance that US2 went above the EIR threshold in trips generated and in parking.

Union square traffic does not function well now, and is not going to function well anytime in the future. We would look forward to working with the developer on this to come up with solutions to reduce car uses and to work with the city to find ways to encourage more sustainable transportation, walking, biking, public transport etc. We appreciate the continued engagement of MEPA office consistence with its obligations and responsibilities both to the population and the other state agencies involved. GOS.3

Surrounding Neighborhoods

We do not believe that the full possible extent of impacts on surrounding properties and people have yet been studied and we would appreciate the involvement of the city of Somerville and the state agencies to assist in figuring this out. GOS.4

The city and the SRA have an interest in extensive redevelopment of the D Parcels in Union Square, Boynton yards and the Target site, which directly surrounds the neighborhoods. These include properties on Allen, Linden, Charlestown and Merriam Street. These residential neighborhoods will be severely impacted if the current design of D2 were to proceed with its giant 3 story above ground garage (300 parking spots) looming over and abutting the backyards of the long-term property owners of Allen street.

This neighborhood has been under-represented throughout this process.

These neighborhoods offer a large opportunity of higher density, more energy efficient multiunit family housing in a greener environment. For that to occur the D2 parcel and the other designated parcels need to be designed in the way that enhances the development of that neighborhood instead of squelching it. GOS.5

Poor design of the D2 parcel has negative environmental impacts

The Union Square Neighborhood Council recently made a proposal regarding the D2 design. We ask the city and the developers **that any final design for the D blocks support certain principles exemplified in the alternate designs of D2. Namely that:** GOS.6

- **parking be underground**
- **there be a physical and visual connectivity between US and T station**
- **the D2 plaza be at the interior of the D2 parcel protected by buildings**

- **a consideration of future development of Allen St, Merriam St, and Linden St**
- **Civic space be programmable**
- **There be connectivity of green space and publicly accessible nature of any open space**

These proposals are not reflected at all in the current D2 design!

Below is the link to our alternate designs from the community which the proponent is NOT considering.

http://unionsquareneighborhoodcouncil.org/images/docs/180813-D2%20Site%20Design%20Alternatives.pdf

Arguments from US2

The proponents are citing hardship and are arguing that they want their project be granted this waiver so that construction can be coordinated with that of the Union Square T station. But US2 has not promised that they would deliver by that date neither collaterally, nor fiscally. The T is not dependent on private development. It will proceed with the ability for other development to proceed.

In conclusion, we know that the best possible future can only be created through the collaboration of the city the community and the developers. We look forward at working with the city, the developers and the community to create the best design possible for the financial and environmental sustainability of Union Square.

We recommend that the MEPA office not grant this waiver.

Sincerely,

Green and Open Somerville

Tori Antonino

Renee Scott

http://greenopensomerville.blogspot.com/

GOS.1 Accommodations for new GLX station.

Section 1.2.4.4 of the FEIR includes additional details and plans related to the D2 civic open space proposed along Prospect Street and how it will provide access to the station. Figure 1-10 is a detailed site plan for the civic open space, and Figure 1-9 depicts D2 site circulation for various modes of travel, including pedestrian and bicycle facilities. Section 1.3 further discusses the coordination between US2 related to GLX. Figure 1-21 identifies the location and design of all amenities US2 will be providing in connection with the MBTA station, including: MBTA operator's breakroom, accessible restrooms, and janitor's closet; The Ride para-transit drop-off area; bicycle parking and the ADA-compliant access across the D2 civic open space to the station. The portion of the civic open space that provides the ADA-compliant path will be a material consistent with MBTA standards and will designed to ADA standards for minimum width, longitudinal slope and cross slope. In addition, US2 has offered land area on D2 to make room for the MBTA's elevator and/or to install a stair to help improve vertical circulation between the station and the Prospect Street bridge. US2 has also offered to assist in paying for the cost of installing the MBTA elevator. US2 will continue to coordinate with the MBTA, the City and other stakeholders on this issue.

GOS.2 Parking garages.

Vehicular entrances to each of the parking garages will be located off of the pedestrian streets to minimize the number of points of pedestrian and car intersection. The proposed parking garage locations were selected as part of the master planning process to maximize the opportunity for shared parking, thereby reducing the number of parking spaces that would be required in connection with the development of the Project. The largest parking facilities were located on the largest Blocks (D1, D2 and D3) and at the edge of the neighborhood in order to 'intercept' cars and reduce vehicle trips through the heart of the neighborhood. Each of the parking structures that are located on designated pedestrian streets (i.e., Washington Street, Somerville Avenue, Prospect Street, Bow Street and Webster Street) will be lined with non-parking uses to ensure a vibrant and pedestrian friendly streetscape. The Project includes below-grade parking on portions of D1, D3 and D6 where below-grade parking appears feasible. The feasibility of underground parking is very much site dependent and is not universally included in new developments in the metro area, particularly in suburban locations. Feasibility depends on the construction cost, site risks and the market conditions. The construction costs include the premium costs associated with underground construction (e.g., excavation, shoring, dewatering, environmental remediation, etc.) as well as the cost of other benefits provided by the Project. The market conditions include the rents that can be achieved for uses in this location.

US2 will consider indoor air quality measures as part of its process related to its commitment to LEED certifiability within the Project (i.e., LEED Gold on buildings greater than 50,000 sf and LEED Silver on buildings less than 50,000 sf).

GOS.3 Traffic.

US2 is committed to encouraging non-vehicular use by maintaining a robust TDM program to achieve the 60% non-vehicle mode share defined in the DEIR, agreed to in the CDSP and its existing MMP, and consistent with recent zoning, *SomerVision*, and the Union Square Neighborhood Plan.

In combination with proposed pedestrian and bicycle improvements, close proximity to public transit services, and inherent walkable characteristics of the Union Square neighborhood, the Project has been developed consistent with area goals and guidelines to take advantage of, promote and maximize non-auto travel. Included in Chapter 5 of the FEIR is an overview of the programs and commitments of the Project towards meeting these goals.

GOS.4 Impacts on the surrounding neighborhoods.

As noted in Section 1.2.2, page 1-8 of the DEIR, the Project is part of the state-approved Union Square Revitalization Plan, an urban renewal plan (M.G.L. Chapter 121B) that focuses on transit connectivity in order to prepare the area for economic development. The DEIR and the ENF submittal included information about the 10-year public planning and review process that has resulted in the current plan. This process started at City-wide scale with *SomerVision* and then moved to Neighborhood-scale with the Union Square Neighborhood Plan and now to Project-scale with the CDSP. The community's goals, including maximizing neighborhood benefit and minimizing neighborhood impacts have been a consistent driver in the process.

GOS.5 D2 design.

In integrating with the adjacent context, US2 continues to coordinate with the City and Somerville Avenue Streetscape Improvement contractor to the north and the GLX contractor to the south. Similarly, US2 continues to work through site planning relationships to the east and west through the public DSPR process for D2 as required by zoning. The current D2 site plan has been provided as Figure 1-8 of the FEIR. Other Lots will go through DSPR once they are ready for development and their designs advance.

GOS.6 Parcel D2 design.

As discussed in detail in Section 1.2.4.4 of the FEIR, the D2 plaza will serve to link Union Square Station with the existing neighborhood fabric by prioritizing connectivity to Union Square Plaza through the enhancement of the public realm and maximizing its utility. The design approach to this public amenity has evolved with the support of

community feedback and sustained coordination with the MBTA. Pedestrian access is prioritized in the proposed concept by providing direct, at grade access to Union Square Station and by replacing visual and physical barriers with vistas that are tied to Union Square landmarks, including: Prospect Hill Monument, Union Square Plaza and the Historic Post Office.

Locating the plaza at grade provides the added benefit of the gradual separation of public space from Prospect Street using the natural elevation of the street to define an ample space for assembly at the point of greatest separation; a point that similarly boasts ideal southern exposure. Reaching a distance of approximately 125 linear feet from the nearest vehicular travel lane, the generous horizontal distance accommodates a multitude of arrangement options for the planned moveable tables and chairs which will remain flexible to the changing needs of the Plaza's occupants. Most significantly, this physical separation is enhanced with approximately 15 feet of vertical separation between the plaza surface and Prospect Street above. Making the most of the change in grades, the planted green buffer will support a new tree canopy to serve as a backdrop to the safe, pedestrian-centric space that provides for an active, and accessible path to Union Square Station. The spatial organization accommodates ease of movement through the space, while providing for and encouraging lingering, meeting, and gathering for special events and/or impromptu performances.

In regard to connections to Allen Street and the neighborhood to the east of D2, US2 has collaborated with a group of community members, land owners (including Somerville Community Corporation) and the City ("Milk Square Stakeholders") who are doing some planning for potential future growth in the neighborhood east of D2. As part of their planning, the Milk Square Stakeholders have envisioned how Charlestown Street might be relocated to the north to facilitate better east-west connectivity to the east in the future. US2 revised the location of Charlestown Place on the D2 plan to move it further north in order to better facilitate this future condition. In addition, the D2 thoroughfare (or access road) planned along the eastern boundary of D2 will primarily serve vehicles, bicycles and trucks and is intended to serve as a point of service access to D2, but also as a future point of service access at the rear of the lots along Allen Street. This will ultimately serve to make Allen Street more pedestrian friendly, if and when, the properties along Allen Street are improved because their services can load from the rear of the lots. This was a specific goal of the City's Planning Staff, and rear/alley loading is common in many urban environments.

In regard to underground parking, as noted in the DEIR, US2 studied the community proposed alternative, evaluated 'pros' and 'cons', and estimated the cost of the underground parking solution. One of the 'cons' identified that the revised plaza location is not centered on the pedestrian access to Union Square Station. To further understand this alternative, the City hired a third-party construction estimating consultant to estimate the cost of the alternative and some variants. Ultimately, the

premium cost of the alternatives was cost prohibitive. The Project is not able to absorb the additional cost, in addition to all of the other Project benefits outlined herein, and remain financially viable. Project feasibility is further challenged by increased risk, significant schedule delay and design challenges associated with implementation of the alternative plan.

Given the challenges associated with moving the parking underground on D2, US2 revised the approved CDSP civic open space design to make it more resilient to vehicular pollution impacts. The width of the D2 civic open space has been increased to create greater horizontal separation from the civic open space areas most likely to be populated by pedestrians to Prospect Street vehicles. The elevation of the plaza has also been set at approximately the same elevation as the adjacent Union Square Station, allowing the southern approximately 150 feet of the plaza to benefit from being more than seven vertical feet below Prospect Street. The largest portion of the plaza, where people are most inclined to congregate, is at the southern end of D2 and benefits from the most vertical separation from Prospect Street (approximately 10 to 14 vertical feet). A vegetated landscape buffer has also been planned between the Prospect Street sidewalk and the main pedestrian areas of the plaza to further separate main pedestrian areas on the plaza from vehicles.

Secretary Matthew Beaton
Executive Office of Energy & Environmental Affairs
Attn. MEPA Office
100 Cambridge Street Suite 900
Boston, MA 02114

Dear Secretary Beaton,

Please find below my request that you deny the waiver request (EEA#15889) for Phase One of the Union Square (Somerville) Redevelopment.

Response to MEPA Phase One Waiver Request EEA No. 15889

Development according to Union Square Station Associates will mean: a nightmare of rush-hour traffic jams, main streets choked beyond capacity, neighborhood side streets unsafe for anything but a steady stream of automobiles trying to avoid gridlock at key intersections, almost 1000 cars going around and around in circles looking for parking spaces, flooding, sharply increased noise levels and air pollution, and, close to 5000 workers seeking housing in Somerville adding to the already-astronomical housing pressures.

This is what Union Square Station Associates admits to in their request for a waiver on Phase One of their $1 billion, 15 acre, 2.4 million square foot development. The actual impacts will be much worse. They admit that MEPA Thresholds have been met on the Phase One site for transportation, waste water service, and soil contamination. US2 suggests solutions for some of these impacts, but for most they throw up their hands, saying that there is no solution, or that it's a regional problem that calls for a regional solution...without suggesting how they can contribute to the regional solution. The solutions that they do suggest will require the expenditure of millions of dollars, but they say little about how much money and who pays.

US2's development plans for the Union Square Revitalization Area, as documented in all agreements with the city of Somerville, the Somerville Redevelopment Authority, and the Somerville Planning Board, are three times the size of the area in Phase One submitted for review to MEPA. The three phases are planned to follow in close proximity to one another, over a period of at least twenty years. By submitting for approval, one phase at a time, and asking for a waiver, US2 is engaging in a not-to-vailed attempt to minimize the full environmental impact of their plans.

US2's own consultants, by throwing up their hands saying that there are no solutions for some of the problems, or casting them as requiring regional solutions, have made a case for why this development should not be built according to the current plan. At the same time, by requesting a waiver, US2 is trying to avoid examining the range and extent of environmental impacts created by a genuine reduced-density alternative plan as required by a full environmental review.

In a full environmental review the developer would probably be required to examine an alternative plan for development that is at least 20-30% less dense than the current proposal. The Somerville Board of Aldermen, Somerville Redevelopment Authority, and the Somerville Planning Board need to see what such an alternative looks like so that they can evaluate the tradeoffs for a more dense vs. a less dense development. If even the less dense plan is environmentally unsound, then further reductions might be made. US2 must add to, correct, and improve on their data, methodology, analysis, and conclusions in the various environmental impact areas as detailed further in this letter.

But first, it is important to address the contentions that US2 and its consultants have made to argue for a determination of waiver appropriateness. The first of these claims is undue hardship. The applicant has not documented the original timetable for construction and the revised timetable resulting from said delays as a result of regulatory or other causes. And, the applicant has not submitted any alternative solutions to this altered timetable, such as possible expedited construction times as a result of favorable contractor and construction trade agreements. The public and the Secretary are expected to take the developer's word for it without any evidence.

The second of these claims is that the potential environmental impacts of Phase One alone, are insignificant. There is a lot of evidence presented to support this claim. But, all of it pales in the face of inadequate, incomplete, and incorrect examination of these impacts. And, when consultants throw up their hands on traffic impacts or talk about regional solutions without describing how this development takes responsibility for the part of the regional problem that they are contributing to, then you can't say that impacts are insignificant.

Ample and unconstrained infrastructure facilities and services do not exist to support Phase One. Many of these facilities and services are only in the planning stages, or under construction as of this date. Examples include the Nunziato Field storm water storage project and the separation of storm water and sewage systems on Washington Street and Somerville Avenue.

The project is not severable. There are many elements of phase two and three that fill out commitments made by the developer as to the overall conformance with Somervision, the Neighborhood Plan and the CDSP. If phase two and phase three are not built, Phase One's environmental impacts would not be fully mitigated.

Lastly, it is hard to imagine a set of conditions that can address all the shortcomings of this filing so that it ensures due compliance with MEPA and 301 CMR11.00 prior to commencement of any other phase of the project.

Alternative development options – a lower density alternative

On the one hand the applicant represents that their lower density plan is The Neighborhood Plan. Then, it represents that the lower density plan just replaces a hotel with a life sciences building. Which is it? And to characterize The Neighborhood Plan as one that has the full community support is untrue. In either case, there is an assumption that all the applicant has to do is subtract some square footage and then said plan can be used to measure the lesser environmental impact. This is not true. A real lower density alternative would reveal how different mix of uses, lower square footage, and different design layouts alter the benefits and problems to the environment. A real lower density alternative would be 20-30% less dense than the current US2 plan. BC.1

Mitigation - Unanswered questions and insufficient responses to environmental conditions & impacts

Transportation and Traffic

When the highly-touted rerouting of two way traffic on Webster and Prospect Streets was implemented this past year traffic backups multiplied many fold, creating many more E and F rated intersections in and around Union Square. These are not reflected in the applicant's traffic counts and resulting calculations as they refer to anticipated air quality. Yes, the exclusive bus and bike lanes improved those modes. But, the claim that auto trips diminished is belied by the fact that the next alternative route over the railroad tracks to the east, on Warren Street in Cambridge, experienced a heavy increase in traffic by BC.2

autos trying to avoid the new backups. Did the applicant measure this increase? The answer is NO. It was not one of the 30 + intersections that were measured. So, we don't know whether anyone got out of their cars or took another route. There was also a marked increase in short turning lanes, further aggravating congestion and delays on Webster and Prospect.

Because so many intersections are already failing without the addition of 1000 US2 development cars, it is imperative that the developer do more than report annually on the effectiveness of their Mobility Management Plan. At a minimum, it should give up-to-date reports every six months. There should be a continuous monitoring with in-street car count strips at critical locations. While the shared parking, bicycle parking opportunities, separating parking spaces from leases, and incentives for transit use are steps in the right direction, there are too many places where the language is not proactive enough. Examples include:- transit passes "encouraged"; when reach a "certain level" then act to mitigate; and, "may be able" to make bulk purchases of passes (for bikes and transit), so as to provide them free to residents. What are the thresholds that trigger such actions? BC.3

The air pollution numbers don't factor in construction vehicle effects on congestion and air quality. There's mention that construction workers arrival times are off peak in the morning...only partially true. They fail to mention the afternoon peak, which begins at 3 PM, leaving time for many construction workers. BC.4

Infrastructure

The applicant talks about "increasing the city's resilience to weather events", but it can't stop the flooding that historically and regularly occurs on this site without the separation of storm and sewer pipes and the Nunziato Field storm water holding facility. BC.5

Soil Contamination

A lot has been said and written about soil contamination on all of the parcels making up Phase One land. In particular, the former Kiley Barrel site has been the subject of many cleaning operations and some environmental reviews. Has an adequate three dimensional study been done of the effects of flooding on the remaining soil contaminants and the close-to-the-surface water table? If not, shouldn't it be part of the Scope of a full EIR? What is it about the plan to cap some of the contaminants that might alter the possibility of alternative lower-density plans including underground parking as one of their elements? BC.6

Open Space and Sustainability

The applicant trumpets the provision of new quality, publically-accessible open space. But, it falls far short of the 30% called for in the Neighborhood Plan and Somervision. Not enough of the open space surfaces are permeable...let alone green. Without more green space, the heat island effect and flooding possibilities will continue to be a problem. And, US2 has chosen to place the major open space for Phase One smack up against the most polluted street bordering the whole Union Square Revitalization District....Prospect Street. How can it be considered quality space when particulates will be raining down on the people sitting there? BC.7

Affordable Housing and Jobs/Workforce Development

Most observers know that displacement has already begun as surrounding rents rise dramatically as landlords anticipate the arrival of the Green Line and associated new development. In order to address this in any substantial way a two-pronged approach needs to be immediately employed. More BC.8

affordable housing and opportunities for better-paying jobs have to be front-loaded in order to have the desired effect. Mitigation cannot be effectuated any other way. So, job linkage and housing linkage fees that are linked to square footage of commercial development already built do nothing to mitigate the pressures that displace residents in the Union Square area. The money comes too late, mostly after the third phase of development. This is another argument for why Phase One is not severable from the rest of the development for evaluating environmental impacts.

Small business relocation and displacement

Much of what makes Union Square unique and attractive to nearby residents and others alike is the diverse character of the businesses and services that are there now. Rising rents are pushing some of these establishments out. The applicant has no comprehensive solution to this trend. What would happen if the applicant offered space in the new development, at their current rent level, to any one of these aforementioned businesses that was displaced? BC.9

Environmental Impacts of Construction

As mentioned before, the traffic and air quality analysis doesn't take into consideration the emissions from construction workers commuting nor the emissions from construction equipment itself. It would be helpful to see more robust commitment to address the effects of this equipment idling. That is, instead of "No Idling" signs, how about banning idling? Instead of saying that turning off idling equipment is "expected", say it will be required. Instead of encouraging the use of low-sulfur fuels, how about requiring it? In addition, there are no specific plans for construction worker parking and only a promise to evaluate whether to commit to the Massachusetts Clear Air Construction Initiative. BC.10 BC.11

Description of the Site

The waiver request does not show evidence of site control. The city still owns much of the land designated for Phase One. And, many of the parcels in phases two and three are not under US2's control. The description of the entire development area is misleadingly negative. Except for the bulk of the Phase One site, which is almost entirely vacant, there are viable, well-maintained retail, commercial and light industrial spaces. One would expect that this realization should change how the applicant approaches all aspects of mitigation. This factor alone suggests that the applicant is not in a legitimate position to be granted a waiver for Phase One. BC.12

I hope that all of the above questions, observations and contentions have made a case for a denial of #EEA 15889, the request for a waiver on Phase One of the Union Square Redevelopment. Thank you for your patience in reviewing my request.

Sincerely,

Bill Cavellini, Co-Chair
Union Square Neighborhood Council
33 Oak Street
Somerville, MA 02143

BC.1 Alternatives.

Chapter 2 of the DEIR included a discussion of alternatives, including a reduced build alternative. Table 2-1 in the DEIR provided an overview of the programs analyzed, the environmental impacts, and the public benefits of each of the analyzed alternatives, including a Reduced Build Alternative.

The Project (described as the Preferred Alternative in Chapter 2 of the DEIR), was recognized within the Urban Redevelopment Plan as coming closest to achieving the key goals for jobs, housing and affordable units of *SomerVision*. This is due in large part to the varied nature of the goals identified through the more than 50 community meetings and three years of public process that require a more balanced distribution of use types that yield the broadest range of benefit. The Project is also the only Zoning-compliant and CDSP Approved Alternative.

BC.2 Webster and Prospect Streets.

Traffic, pedestrian and bicycle counts at all intersections were taken after the two-way conversion, and are incorporated in all the analyses included in the DEIR. The DEIR (Section 4.5.5.5 and Appendix B) provided intersection capacity results for all study area intersection for the 2025 Build Condition for the a.m., p.m., and Saturday peak periods and is consistent with standard TIA guidelines.

BC.3 Traffic monitoring.

MMP requirements are set by the City and are a condition of the CDSP. Individual MMPs for each Lot will be completed with the DSPR.

The Project's monitoring and annual reporting plan provide the necessary data for on-going analysis of transportation conditions and decisions regarding the need for additional mitigation measures.

BC.4 Construction related air pollution.

Construction-related traffic will occur prior to the completion of the Project and will not be consistent throughout the construction period, and therefore modeling impacts would not provide reliable information. The CMPs that will be developed for each Lot will include measures to reduce vehicle trips and include measures to mitigate air quality impacts to the extent practicable.

The p.m. peak hour discussed in the TIA included in the DEIR is between 5:00 p.m. and 6:00 p.m., which is not the time period that it is anticipated that most afternoon

construction traffic will occur. It should be noted that the CMPs will include provisions to discourage single-occupancy vehicle use.

BC.5 Infrastructure to prevent flooding.

Chapter 9 of the DEIR provided information about existing and proposed storm drain infrastructure, as well as stormwater management. Lastly, Section 1.2.2, page 1-24 of the DEIR, Streetscape and Infrastructure Improvements, and Section 1.4 of the FEIR included additional details about the City's expansion of neighborhood stormwater infrastructure and the Project's contributions to that effort. Chapter 4 of the FEIR also provides additional details regarding the Project's approach to stormwater management.

Stormwater management facilities will be implemented on a Lot-by-Lot basis and will conform to all Stormwater Management Standards within the Massachusetts Stormwater Handbook to the maximum extent practicable. These on-site mitigation measures will decrease the peak rate of runoff for all storm events up to and including the 100-year storm event. By doing so, these on-site measures will provide relief to the existing (and proposed) City infrastructure that currently experiences surcharge and flooding during large scale storm events.

The Project will include a number of additional low impact development measures, where feasible and practicable. Residential buildings are anticipated to incorporate both blue and green roof technology to temporarily store stormwater, combined with rain water harvesting for irrigation. Permeable pavement will be substituted for traditional asphalt pavement in areas to promote infiltration and groundwater recharge. Additionally, rain gardens will be constructed in pervious areas to promote water quality treatment and groundwater recharge.

BC.6 Contaminated soil.

A full-scale three-dimensional study on the effects of flooding at D2 Block has not been performed; however, residual soil impacts are anticipated to be located beneath three feet of clean soil, pavement, and/or the proposed buildings. Therefore, in the event of shallow groundwater flooding, there would be a barrier in place to prevent potential migration of impacted sediment in flood water. The plan to use protective barriers does not preclude alternative designs and/or below grade parking; however, shallow groundwater and the potential for impacted soil and/or groundwater at the site make below grade parking less attractive to the Project.

Chapter 8 of the DEIR discussed the anticipated approaches to achieve a level of No Significant Risk on applicable sites. Specifically, the assessment and remediation approaches are outlined for each Block in the following sections: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7

Block: 8.8.3. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. In certain instances, installation of protective barriers may be used to cap contaminated soil. In such instances, the barrier will be separated from the underlying layers by a geotextile or other similar material to provide a visual marker and to separate the upper clean materials from the lower contaminated soil. In paved or hardscaped areas, the barrier will be a minimum of one-foot thick consisting of clean soil, base material and the pavement or concrete surface finish. Use of protective barriers to achieve and maintain a level of No Significant Risk will require the recording of an AUL that demonstrates where the barriers are located and describes the required maintenance of the barrier. In cases where existing AULs are present, construction will be performed in a manner that is consistent with the AULs.

BC.7 Open space.

The Union Square Overlay District Zoning was adopted to codify the Union Square Neighborhood Plan targets and requires US2 to create more open space and public realm (25%) than what was recommended by the Union Square Neighborhood Plan (15%). As part of the open space and public realm improvements, the approved plan will deliver over 2.5 acres of new, public civic open spaces (see Section 1.2.4.4 of the FEIR for details about the proposed civic open spaces). Section 6.6.1 of the DEIR, page 6-7, also described how the new civic open spaces will incorporate landscape, add permeable hardscape and add to the urban tree canopy to combat climate change effects and improve neighborhood livability.

The Mayor's Office of Strategic Planning & Community Development in Somerville recently developed a new system for planning and regulating the creation of public spaces within Somerville. To create this system, planners identified the characteristics that make spaces different from one another, and then built a typological menu of spaces that meet unique community needs. These special spaces were called 'Civic Spaces', named to reflect the important civic role that public spaces play in community building. Together, these civic open space types accommodate different needs in different ways, providing a flexible system to not only ensure that high-quality design would govern their delivery, but to also provide a tool to calibrate unique space types to unique locations, remaining responsive to an area's users and specific needs. To do this, each civic open space type has a unique set of design standards that guide certain qualities and parameters of the type, including the dimensions of the lot, the seating and tables to be provided, the quantity of tree planting and other planted surfaces, as well as the overall percentage of perviousness of the site. Overall, the civic open space requirements reflect the desire for permeable surfaces, substantial planting and significant tree canopy prioritized by the community.

BC.8 Affordable housing.

The intent of the Project is to provide a mix of uses consistent with an employment center, and includes housing to allow workers to live near their places of employment. The first phase of development includes both residential and commercial space, which will provide affordable housing and new jobs.

In regard to affordable housing, approximately 200 permanently affordable housing units on-site, a portion of which will be included in D2 which includes the first residential building anticipated to be constructed, in addition to the approximately $10.9 million in housing linkage funds to support additional affordable housing in the City. In addition, as detailed in Table 1-2 and Chapter 5 of the FEIR, linkage payments and many of the other financial contributions from US2 will occur after the completion of each phase, and in some cases, at the completion of each building.

BC.9 Space for displaced businesses.

Existing businesses that are located on redevelopment parcels will be provided relocation assistance in accordance with the Commonwealth-approved Union Square Revitalization Plan and Massachusetts General Laws Chapter 79A and Regulations at 760 CMR 27.00 et seq. as individual parcels are acquired.

For the eight existing businesses located on redevelopment parcels that have uses that are consistent with the vision for Union Square outlined in the Union Square Neighborhood Plan and are permitted uses in the Union Square Overlay District zoning, US2 will offer these businesses an opportunity to remain in Union Square and will work with these businesses to identify space for their business within the redevelopment.

BC.10 Construction impacts.

Construction-related traffic will occur prior to the completion of the Project and will not be consistent throughout the construction period, and therefore modeling impacts would not provide reliable information. The CMPs that will be developed for each Lot will include measures to reduce vehicle trips and include measures to mitigate air quality impacts to the extent practicable. Chapter 12 of the DEIR included information about construction impacts and the CMPs that will be required.

The transportation analysis in the DEIR is reflective of the full build condition of the Project. Construction-related traffic will occur prior to the completion of the Project and will not be consistent throughout the construction period. The CMPs that will be developed for each Lot will include measures to reduce vehicle trips and promote alternative modes of transportation. In addition, construction trucks that will be delivering materials or taking materials from the Project site will be required to follow truck routes and obey rules that will be incorporated into the CMPs.

BC.11 **No idling, low-sulfur fuels and worker parking.**

Construction equipment emissions will also not be consistent, and therefore modeling could only occur with assumptions which would not provide reliable information to identify impacts. All construction trucks will be required to comply with the Massachusetts anti-idling regulations. It is likely that US2 will use a contractor that uses pollution controls and low-sulfur fuels on their fleet of heavy construction equipment, and US2 will strongly encourage the contractor to utilize heavy equipment with pollution controls and use low-sulfur fuels for the Project. During the development of Project CMPs, US2 will request from the contractor a certified list of the non-road diesel-powered construction equipment that includes emission control devices. US2 will evaluate the need and feasibility of requiring low-sulfur fuels as construction managers are identified for each development.

The location and other information regarding worker parking will be identified in the CMPs. This information is not currently available as construction logistics for the developments have not advanced to this level. As noted previously, the CMPs will discourage single-occupancy vehicle use and encourage alternative modes of transportation to and from the construction sites.

US2 supports the intent of the Massachusetts Clean Air Construction Initiative, and understands that the requirements would be the responsibility of each construction manager. US2 will discuss the initiative which each chosen construction manager to promote the aspects of the initiative and discuss the feasibility of each requirement that the construction manager will be required to comply with.

BC.12 **Site Control**

The SRA and US2 are parties to the Master Land Disposition Agreement (MLDA), which sets terms for acquisition and redevelopment of the D Blocks and serves as the land disposition agreement with respect to D2, which is currently owned by the City/SRA. The MLDA also identifies the process for acquisition and development of the other D Blocks, including schedule commitments related to overall development and construction of individual projects. Pursuant to the MLDA, US2 must use good faith diligent efforts to privately acquire the parcels comprising subsequent phases of the Project and must keep the SRA apprised of these efforts on a quarterly basis. If despite US2's private negotiations it has not acquired a parcel in time to facilitate development of the applicable portion of the Project in accordance with the master Project schedule, US2 may request that the SRA initiate eminent domain, and the MLDA provides for the SRA to then take such parcel by eminent domain and convey it to US2 (or its affiliate). The MLDA further provides for US2 (or the applicable parcel developer, which may be a US2 affiliate) to enter into a land disposition agreement with the SRA with respect to development of the applicable property following its acquisition. The individual land disposition agreements respecting subsequent phases are to also govern development

of the parcels acquired thereunder. The Project will comply with all requirements of the MLDA respecting acquisition of individual parcels, as well as all requirements for issuance of certificates of compliance.

August 23, 2018

Matthew Beaton, Secretary

Executive Office of Energy and Environmental Affairs
Attn: MEPA Office / MEPA Analyst Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Via email to Mr. Alex Strysky

RE: **EEA#15889, ENF, Union Square Redevelopment, Somerville MA**

Dear Secretary Beacon

My name is Tori Antonino, I live on Prospect Hill right outside Union Square. I have been engaging in this development process for several years. I am an environmental advocate and am committed to creating a healthy sustainable Union Square.

After attending the MEPA information session on August 2 and reviewing the proponent's application, my determination is that the proponent US2 not be granted the waiver and here's why.

Public Process

While going over the document I was struck at how exhaustive the public process appears to have been. It has been long and people are frustrated, but it has failed to produce a design that reflect the values that came of these years long process. We ordained documents and wrote policy on having a healthy, equitable, environmentally sustainable, activated urban transit center have a public realm that invites, excites and stays true to our goals of SOMERVISION goals of connectivity, sense of place and a prioritization of people.

If ordained documents of community values and years long process fail to create what we envisioned then it means the process is not done and the proposal is not satisfactory.

Phase 1 design

What is not in US2's proposal is how vocally critical and unsatisfied the majority of the community is towards this Phase 1 design. The public realm is in an unhealthy location. There is no sense of place. TA.1
There are no sightlines that identify where you are save for the 24 story tower that greets you on arrival. There is a behemoth of a three story above ground parking garage looming over residential neighborhoods. Where the need for residents to access green and open spaces is essential for physical and mental health and where environmental justice and valuing open spaces have been historically absent throughout Somerville's development, US2 has delineated the largest green and open space on the D2 parcel to be a private amenity space for residents in the tower. It occupies the entire roof of the parking garage.

Traffic impacts and residents' health

I am also concerned that the traffic impacts have not adequately been studied. I worry about TA.2
increasing people's exposure to particulate matter by putting the main civic space adjacent to Prospect TA.3
Street. The error US2 made in their application stating that 22 Bennet Street had been part of the toxic TA.4
Kylie Barrel site remediation of 2013 makes me certain the proponents are unconcerned about the health of people here.

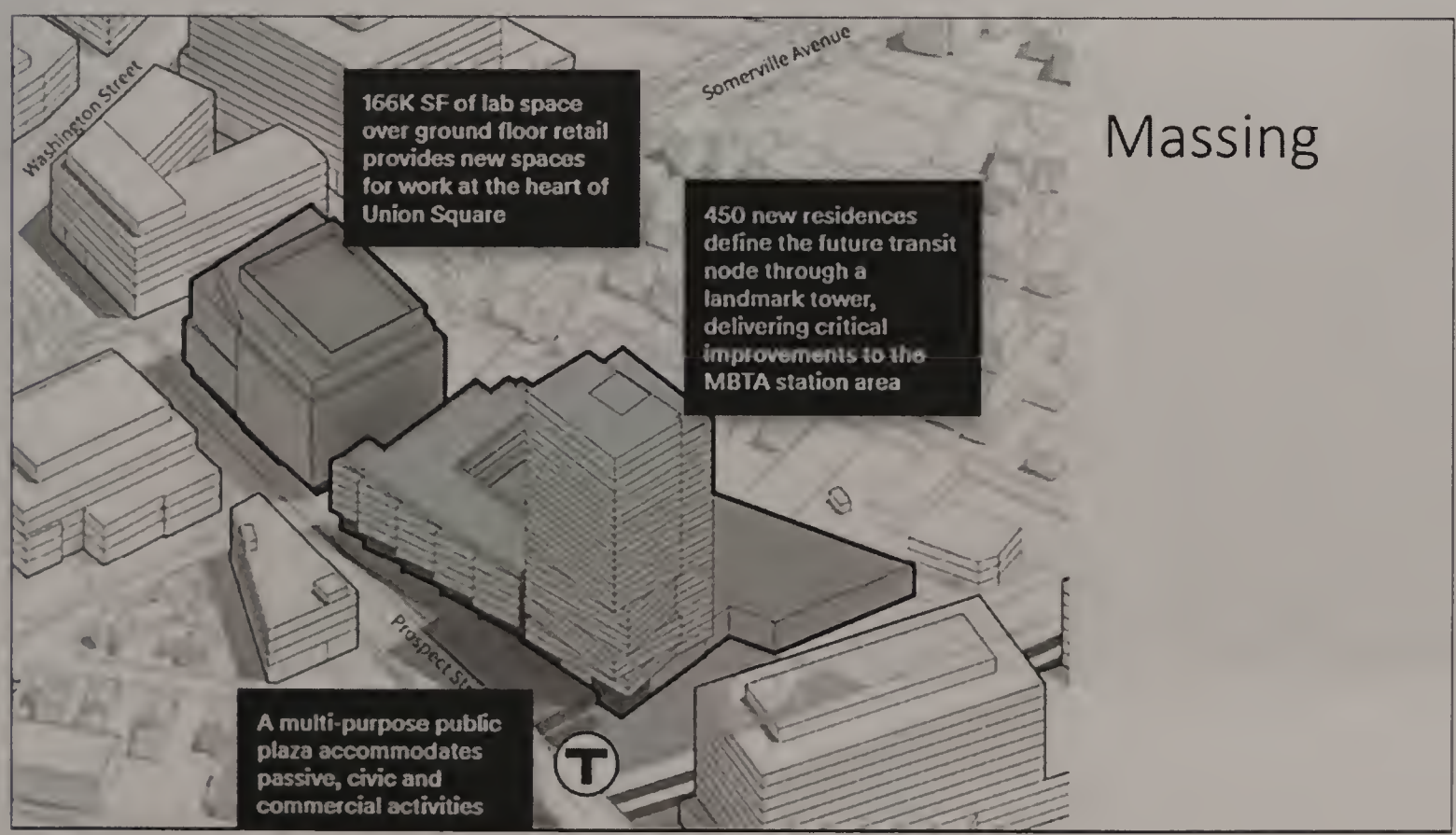
US2 has passed the EIR threshold in trips generated and parking. This alone should be enough to deny a waiver, but I'll try to put a finer point on it. As the current design shows the largest chunk of civic TA.5
space will be adjacent to least five hours of bumper to bumper weekday traffic. This is before anything is built, before the +4,992 (unadjusted) new trips predicted for phase 1 are generated.

That means the plaza and the people encouraged to be there will be blanketed with pollution and particulate matter throughout the day. Although regulations may have yet to catch up, the science on particulate matter is in. These ultra-fine particles wreak havoc with people's health causing asthma, cancer, cardiovascular illness, autism and other illnesses.

More immediately, it means the air will be heavy with exhaust. It will be hot, noisy and without shade. This is not the experience we want for those who come to Union Square. The public realm gives a place its identity. I want people to remember Somerville for its green, healthy and vibrant civic space not for its gray polluted one that poses a health risk to the people who use them.

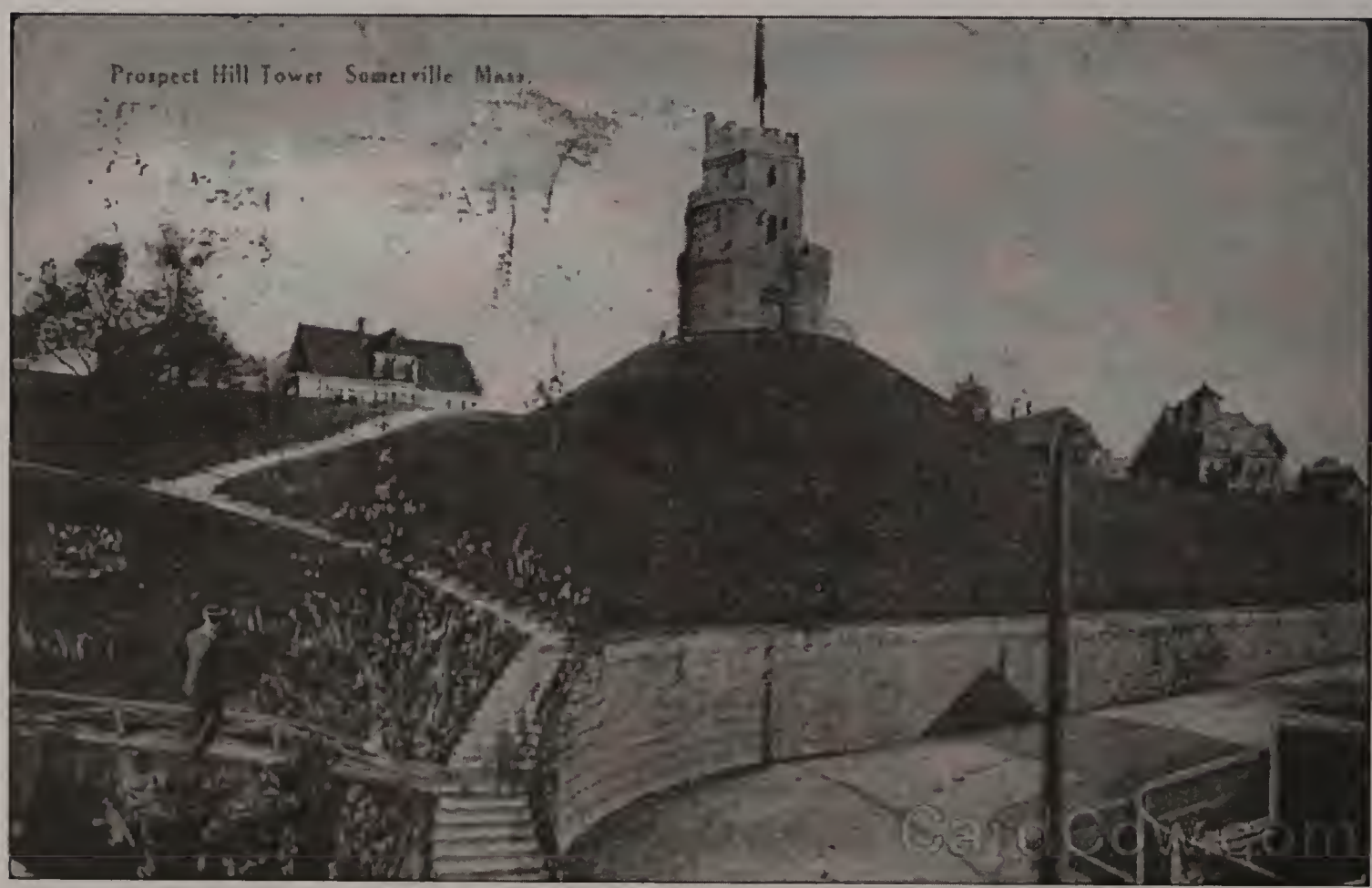
I would like to see US2 investigate the health impacts of the particulate matter generated in this plaza. TA.6
Since the public realm will guide our pathways throughout the day, we need to build them with the health of the people in mind first.

Below is the US2 design proposal with the plaza bordered by Prospect Street and the train tracks.



Here is a concept of what I would like Union Square Station to look more like:

The plaza is protected by the buildings. When you get off the train there is an immediate sight line to the Prospect Hill Monument and the Old Post Office.



This design came out of a recent community design charrette, where 3 teams of architects, planners and visioners were given different challenges to come up with a better design. The one shown has a single layer of underground parking across the D2.2 parcel and was created by Tim, Talun and Anne Tate.

Slideshow presentation:

http://unionsquareneighborhoodcouncil.org/images/docs/180813-D2%20Site%20Design%20Alternatives.pdf

I share all this work with you because I am a passionate resident, one of many, who is determined to get this project right. We ask that the secretary not grant this waiver. We need as much oversight and assistance from outside agencies as possible. We want to build a square that is healthy, sustainable, equitable. We look forward to working with MEPA, the developer, the MBTA and the city to taking steps to make this possible.

Thank you for your attention,

Tori Antonino

Boston Street, Somervile

TA.1 D2 design.

US2 has been refining the D2 design based on community feedback throughout the DSPR process required by zoning. The proposed location of the D2 civic open space is consistent with the Union Square Neighborhood Plan and the approved CDSP. The D2 plan has evolved through community feedback, and has reduced private building areas so as to increase the size of civic open space on D2. The current D2 site plan is provided as Figure 1-8 of the FEIR.

TA.2 Traffic impacts.

The DEIR (Section 4.5.5.5) provided intersection capacity results for all study area intersection for the 2025 Build Condition for the a.m., p.m., and Saturday peak periods and is consistent with standard TIA guidelines.

TA.3 Proposed main civic space location.

In direct response to these community comments, US2 has improved the D2 design by increasing the size of the plaza by more than 33% and has also added a new publicly-accessible green space of approximately 2,300 sf on D2 near the MBTA station platform. In addition, the plaza has been widened to create greater horizontal separation from Prospect Street vehicles. The elevation of the plaza has also been set at approximately the same elevation as the adjacent Union Square Station allowing the southern 150 feet of the plaza to benefit from being approximately seven vertical feet below Prospect Street. The largest portion of the plaza, where people are most inclined to congregate, is at the southern end of D2 and benefits from the most vertical separation from Prospect Street (approximately 10 to 14 vertical feet). A vegetated landscape buffer has also been planned between the Prospect Street sidewalk and the main pedestrian areas of the plaza to further separate main pedestrian areas on the plaza from the vehicles.

TA.4 Contaminated soil.

The contamination of D2 is well known to US2 and US2 understands the health concerns that the community has raised. The remediation of all of the Lots will be completed to bring the sites to a level of No Significant Risk. This is important to US2 as the safety of the site for future users is necessary for the viability of the Project.

TA.5 D2 Civic Space.

In direct response to these community comments, US2 has improved the D2 design by increasing the size of the plaza by more than 33% and has also added a new publicly-accessible green space of approximately 2,300 sf on D2 near the MBTA station platform. In addition, the plaza has been widened to create greater horizontal separation from

Prospect Street vehicles. The elevation of the plaza has also been set at approximately the same elevation as the adjacent Union Square Station allowing the southern 150 feet of the plaza to benefit from being approximately seven vertical feet below Prospect Street. The largest portion of the plaza, where people are most inclined to congregate, is at the southern end of D2 and benefits from the most vertical separation from Prospect Street (approximately 10 to 14 vertical feet). A vegetated landscape buffer has also been planned between the Prospect Street sidewalk and the main pedestrian areas of the plaza to further separate main pedestrian areas on the plaza from the vehicles.

TA.6 Particulate matter generated by plaza.

As mentioned above, US2 has made changes to the plaza in response to community concerns. US2 is aware of the concern regarding ultrafine particles, and continues to evaluate measures to minimize the impact of vehicle-related pollutants on users of the Project site, including designing horizontal and vertical separation between the D2 civic open space and vehicles as well as the strategic placement of vegetation. US2 believes that it is important for the community and the Project to create a welcoming, enjoyable civic open space on D2. Continued coordination with the City, the GLX contractor, and the community will ensure it is the successful and safe public open space contemplated in the Union Square Neighborhood Plan.

August 23, 2018
Matthew Beaton, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office / MEPA Analyst Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Via email to Mr. Alex Strysky
RE: EEA#15889, ENF, Union Square Redevelopment, Somerville MA

Dear Secretary Beaton,

I'm writing express my objection to the granting of a Phase 1 waiver to the proponents, with particular emphasis on the unanalyzed impacts of particulate matter on pedestrians and congregants in the proposed 'Plaza' that abuts Prospect Street.

This public space is designed in such a way to attract congregant and users, and encourage them to linger. Unfortunately, it also abuts a gridlocked thoroughfare—Prospect Street—that runs in 2 directions. This street is already graded an "F" for traffic, and will only get worse with the increased usage from the development. This effectively what the law calls an "attractive nuisance". It lures people to a newly created plaza where they will have the opportunity to suck down carcinogenic nanoparticles is creating a **new public health hazard** where there currently is none. JK.1

This is particularly galling given the fact that the Green Line is only coming to Somerville because of a lawsuit about mitigating pollution from I-93, which cuts through the East part of our city. Now, new risks to public health are being introduced by luring people to an area of heightened local pollution.

Solutions to this have been proposed. All three alternatives proposed by our Neighborhood Council's Design Committee place the Plaza behind a built structure, in an area enclosed by buildings. This design would shield recreants from the harmful plumes of nanoparticles, and make it a much safer and enjoyable place to congregate.

I urge MEPA to not grant the waiver, and direct the proponents to investigate and pursue a design that does not attract the public to a hazardous pollutant-filled plaza. This is essential mitigation that the proponents have not addressed, and it should be disqualifying.

Sincerely,

Jacob Kramer
8 Quincy St. Somerville, MA 02143
Board Member of the Union Square Neighborhood Council

JK.1 **Public space design.**

In direct response to these community comments, US2 has improved the D2 design by increasing the size of the plaza by more than 33% and has also added a new publicly-accessible green space of approximately 2,300 sf on D2 near the MBTA station platform. In addition, the plaza has been widened to create greater horizontal separation from Prospect Street vehicles. The elevation of the plaza has also been set at approximately the same elevation as the adjacent Union Square Station allowing the southern 150 feet of the plaza to benefit from being approximately seven vertical feet below Prospect Street. The largest portion of the plaza, where people are most inclined to congregate, is at the southern end of D2 and benefits from the most vertical separation from Prospect Street (approximately 10 to 14 vertical feet). A vegetated landscape buffer has also been planned between the Prospect Street sidewalk and the main pedestrian areas of the plaza to further separate main pedestrian areas on the plaza from the vehicles. US2 believes that it is important for the community and the Project to create a welcoming, enjoyable civic open space on D2.

Wig Zamore
13 Highland Avenue #3
Somerville MA 02143
617-625-5630
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August 23, 2018

Matthew Beaton, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office / MEPA Analyst Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Via email to Mr. Alex Strysky to alexander.strysky@mass.gov

RE: **EEA#15889, Expanded ENF with Phase 1 Waiver Request, Union Square Redevelopment, Somerville MA**

Dear Secretary Beaton,

I am writing with a request that you deny the Phase 1 Waiver for the Union Square Re-development (#15889) but with great longer term enthusiasm for this new era of Union Square evolution. The D2 Block lies between the new GLX T-Stop, re-development potential in almost all directions and environmental justice neighborhoods to the East and Northeast. **It is THE keystone block.**

D2 is the single most important block to be developed not only in this particular 2.4 million square foot mixed use development proposed by US2 and the SRA, but also the single block in all of Union Square that is least separable from our exciting and evolving urban mixed use center. It is inseparable from the rest of the D Block re-developments and their more sustainable future.

The new Union Square GLX T-Stop being developed by the MBTA adjacent to D2 is the largest Massachusetts investment in a light rail spur and single station in over 60 years. This new electric transit facility, fought for by residents, businesses and local leaders for the last two decades, must serve daily visitors and residents in all directions if we are to build a more resilient Somerville.

Currently, the planned path of travel to the T-Stop from the heart of Union Square at the intersection of Washington Street, Somerville Avenue and Prospect Street lies in the middle of the most traffic polluted portion of Union Square. The planned path of travel from the heart of Union Square also has many steps, and will not allow mobility challenged T users to share the same route.

The proposed D2 path to the T-Stop, shown as a retail intense area adjacent to Prospect Street, will not be a great place to hang out. Traffic levels are expected to increase with development of the D Blocks and there will be increases in pollution intensity brought on by the canyon effect of higher buildings and greater street wall frontage on these most congested streets of Union Square.

Tufts University, the Somerville Transportation Equity Partnership and the City of Somerville have worked together on some of the most advanced environmental epidemiology studies of traffic pollution and cardiovascular biomarkers of risk, such as C Reactive Protein and Interleukin 6. We have shown in those areas of Somerville studied most intensely that there is a significant relationship between traffic ultrafine particulate exposure (UFP PNC) and these health risks. Our studies have been funded by US NIH, US HUD and US EPA, as well as the Kresge Foundation.

I would be happy to make available to you a dozen or two of our "CAFEH" studies upon request.

Other things being equal, those who live within 50 to 100 meters of very busy roadways in advanced economies should expect to incur 50% or more increased risk of annual cardiovascular and lung cancer mortalities, and similar increases in incidence of childhood asthma and autism.

I am attaching several excellent whole city environmental epidemiology studies from Stockholm, Copenhagen and Vancouver showing these increased traffic pollution mortality risks, and studies from California showing the increased risks of childhood asthma and autism spectrum disorders. Note that all but the ASD studies are well-established, while the ASD literature is still evolving.

Furthermore, the future D2 Block also hosts the most intense known but unresolved ground pollution in Union Square, with 17 recorded sites of concern to Mass DEP and US EPA. The EENF has a mere page and a half of text very vaguely describing the number of polluted sites of concern, and containing little information on recent testing of the D2 Block, or future mitigation strategies. WZ.1

I fervently hope that the development of the D Blocks will be everything that Somerville citizens could hope for, and also robustly profitable for the project proponents. Improved long term live work balance is critical to Somerville's future. I am a firm supporter of Somerville's Comprehensive Plan, SomerVision, and its balanced goals of 6000 new housing units, 20% affordable, 30,000 new jobs, and 125 new acres of green and open space, accompanied by more sustainable clean transit, and active transport in the form of better walking and biking facilities.

Thank you for considering these comments.

Most Respectfully, Wig Zamore

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Supplemental Material

A Study of the Combined Effects of Physical Activity and Air Pollution on Mortality in Elderly Urban Residents: The Danish Diet, Cancer, and Health Cohort

Zorana Jovanovic Andersen, Audrey de Nazelle, Michelle Ann Mendez, Judith Garcia-Aymerich, Ole Hertel, Anne Tjønneland, Kim Overvad, Ole Raaschou-Nielsen, and Mark J. Nieuwenhuijsen

AirGIS Human Exposure Modelling System

AirGIS (Jensen et al. 2001) is based on a geographical information system (GIS) and used for estimating traffic-related air pollution and has high temporal (an hour) and spatial (individual address) resolution. AirGIS (see: http://AirGIS.dmu.dk) calculates air pollution at a location as the sum of three contributors: (1) local air pollution from street traffic, calculated with the Operational Street Pollution Model (Berkowicz R 2000) (OSPM) from data on traffic (intensity and type), emission factors for each vehicle type and EURO class, street and building geometry, and meteorology; (2) urban background, calculated from a simplified urban background (SUB) procedure (Berkowicz et al. 2008) that takes into account urban vehicle emission density, city dimensions (transport distance), and average building height (initial dispersion height); and (3) regional background, estimated from trends at rural monitoring stations and from national vehicle emissions (Jensen SS 1998). Input data for the AirGIS system come from various sources: a GIS-based national street and traffic database, including construction year and traffic data for the period 1960–2005, (Jensen SS et al. 2009a) and a database on emission factors for the Danish car fleet (Berkowicz R et al. 2006; Ketzel M et al. 2007), with data on light- and heavy-duty vehicles dating back to 1960, built and entered into the emission module of the OSPM. A national GIS database with building footprints supplemented with construction year and building height from the national building and dwelling register, national survey and cadastre data-bases, and a national terrain-evaluation model, provided the correct street geometry for a given year at a given address. With a geocoded address and a year, the starting point is specified in place and time, and the AirGIS system automatically generates street configuration data for the OSPM, including street orientation, street width, building heights in wind sectors, traffic intensity and type, and the other data required for the model. Air pollution is calculated in

2m height at the façade of the building. The AirGIS system has been successfully validated (Berkowicz R 2008; Raaschou-Nielsen O et al. 2000) and used in a number of studies, few early examples listed here (Jensen SS et al. 2009b; Hertel O et al. 2001; Hertel O. et el. 2008).

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Table S1. Adjusted associations[a] of total and cause-specific mortality with cycling among 52,061 participants in Diet, Cancer and Health cohort, by intensity of cycling and different levels of NO_2.

Physical Activity	Low NO_2 (< 15.1 µg/m^3) HR (95% CI	Moderate NO_2 (15.1-23.9 µg/m^3) HR (95% CI	Very high NO_2 (≥ 23.9 µg/m^3) HR (95% CI	*p-value*[b]
Total mortality (*n* = 5,534)				
Does not cycle	1.00	1.26 (1.15, 1.39)	1.39 (1.22, 1.58)	
Cycles 0.5-4 h/week	0.87 (0.79, 0.95)	1.00 (0.91, 1.10)	1.10 (0.96, 1.26)	
Cycles >4 h/week	0.82 (0.72, 0.93)	1.02 (0.92, 1.14)	1.19 (1.01, 1.40)	*0.52*
Cancer mortality (*n* = 2,864)				
Does not cycle	1.00	1.22 (1.07, 1.39)	1.36 (1.13, 1.64)	
Cycles 0.5-4 h/week	0.97 (0.86, 1.10)	1.09 (0.96, 1.23)	1.19 (0.98, 1.45)	
Cycles >4 h/week	0.91 (0.76, 1.08)	1.14 (0.99, 1.33)	1.16 (0.92, 1.47)	*0.71*
Cardiovascular mortality (*n* = 1,285)				
Does not cycle	1.00	1.36 (1.13, 1.64)	1.78 (1.39, 2.29)	
Cycles 0.5-4 h/week	0.83 (0.68, 1.01)	1.09 (0.90, 1.31)	1.21 (0.91, 1.61)	
Cycles >4 h/week	0.73 (0.55, 0.96)	0.98 (0.78, 1.23)	1.38 (1.00, 1.91)	*0.78*
Respiratory mortality (*n* = 354)				
Does not cycle	1.00	1.02 (0.74, 1.40)	0.73 (0.45, 1.18)	
Cycles 0.5-2 h/week	0.56 (0.39, 0.81)	0.72 (0.51, 1.02)	0.48 (0.26, 0.89)	
Cycles >4 h/week	0.49 (0.28, 0.85)	0.57 (0.37, 0.88)	0.57 (0.29, 1.12)	*0.78*
Diabetes mortality (*n* = 122)				
Does not cycle	1.00	1.36 (0.79, 2.37)	1.20 (0.56, 2.53)	
Cycles 0.5-2 h/week	0.69 (0.35, 1.34)	0.86 (0.46, 1.61)	0.69 (0.25, 1.84)	
Cycles >4 h/week	0.55 (0.21, 1.47)	0.75 (0.36, 1.56)	0.56 (0.16, 1.91)	*0.98*

HR hazard ratio; CI confidence interval.

[a]Adjusted for NO_2, gender, calendar year, and mutually for other three physical activities, occupational physical activity, smoking status, smoking intensity, smoking duration, alcohol intake, environmental tobacco smoke, education, fruit and vegetable intake, fat intake, risk occupation, mean income in municipality, and stratified by marital status. [b]*p*-value for interaction.

Table S2. Adjusted Associations[a] of total and respiratory with different types of physical activities in 52,061 participants in Diet, Cancer and Health cohort with definition of high NO_2 above 90th percentile (23.9 μg/m^3).

Physical Activity	Main Model Fully Adjusted HR (95% CI)	Interaction Model Moderate/Low NO_2 (< 23.9 μg/m^3) HR (95% CI)	Interaction Model High NO_2 (≥ 23.9 μg/m^3) HR (95% CI)	*p-value*[b]
Total natural mortality (*n* = 5,534)				
Sports	0.78 (0.73, 0.82)	0.78 (0.74, 0.83)	0.74 (0.63, 0.87)	*0.38*
Cycling	0.83 (0.78, 0.88)	0.84 (0.79, 0. 88)	0.81 (0.71, 0.93)	*0.48*
Gardening	0.84 (0.79, 0.89)	0.86 (0.80, 0.92)	0.78 (0.72, 0.91)	*0.79*
Walking	0.96 (0.88, 1.06)	0.96 (0.87, 1.07)	0.95 (0.72, 1.27)	*0.85*
Respiratory mortality (*n* = 354)				
Sports	0.60 (0.47, 0.77)	0.62 (0.47, 0.80)	0.57 (0.28, 1.18)	*0.98*
Cycling	0.62 (0.50, 0.77)	0.61 (0.48, 0.77)	0.74 (0.39, 1.38)	*0.62*
Gardening	0.63 (0.50, 0.79)	0.61 (0.48, 0.78)	0.79 (0.42, 1.51)	*0.35*
Walking	0.71 (0.51, 0.97)	0.73 (0.52, 1.02)	0.67 (0.24, 1.83)	*0.65*

HR hazard ratio; CI confidence interval.

[a]Adjusted for NO_2, gender, calendar year, and mutually for other three physical activities, occupational physical activity, smoking status, smoking intensity, smoking duration, alcohol intake, environmental tobacco smoke, education, fruit and vegetable intake, fat intake, risk occupation, mean income in municipality, and stratified by marital status. p[b]*p*-value for interaction.

Table S3. Adjusted associations[a] of total and respiratory mortality with different types of physical activities in 13,948 participants in Diet, Cancer and Health cohort who lived in inner Copenhagen (Frederiksberg and Copenhagen municipalities, with 75th percentile of NO_2 of 24.0 μg /m^3).

Physical Activity	Main Model Fully Adjusted[b] HR (95% CI)	Interaction Model Moderate/Low NO_2 (< 24.0 μg/m^3) HR (95% CI)	Interaction Model High NO_2 (≥ 24.0 μg/m^3) HR (95% CI)	*p-value*[b]
Total natural mortality (*n* = 2,053)				
Sports	0.77 (0.70, 0.85)	0.79 (0.70, 0.88)	0.75 (0.62, 0.90)	*0.67*
Cycling	0.86 (0.78, 0.94)	0.88 (0.79, 0.99)	0.82 (0.69, 0.97)	*0.40*
Gardening	0.84 (0.76, 0.92)	0.86 (0.77, 0.95)	0.79 (0.66, 0.94)	*0.51*
Walking	0.90 (0.77, 1.06)	0.89 (0.74, 1.08)	0.90 (0.65, 1.27)	*0.81*
Respiratory mortality (*n* = 163)				
Sports	0.52 (0.36, 0.77)	0.58 (0.38, 0.88)	0.41 (0.16, 1.05)	*0.57*
Cycling	0.74 (0.54, 1.02)	0.73 (0.51, 1.04)	0.84 (0.40, 1.76)	*0.72*
Gardening	0.66 (0.47, 0.93)	0.68 (0.46, 0.99)	0.71 (0.32, 1.55)	*0.95*
Walking	0.77 (0.45, 1.29)	0.88 (0.48, 1.61)	0.49 (0.16, 1.52)	*0.36*

HR hazard ratio; CI confidence interval.

[a]Adjusted for NO_2, gender, calendar year, and mutually for other three physical activities, occupational physical activity, smoking status, smoking intensity, smoking duration, alcohol intake, environmental tobacco smoke, education, fruit and vegetable intake, fat intake, risk occupation, mean income in municipality, and stratified by marital status. [b]*p*-value for interaction.

Changes in Residential Proximity to Road Traffic and the Risk of Death From Coronary Heart Disease

Wen Qi Gan,[a] *Lillian Tamburic,*[b] *Hugh W. Davies,*[a] *Paul A. Demers,*[a,c] *Mieke Koehoorn,*[a,c] *and Michael Brauer*[a]

Background: Residential proximity to road traffic is associated with increased coronary heart disease (CHD) morbidity and mortality. It is unknown, however, whether changes in residential proximity to traffic could alter the risk of CHD mortality.

Methods: We used a population-based cohort study with a 5-year exposure period and a 4-year follow-up period to explore the association between changes in residential proximity to road traffic and the risk of CHD mortality. The cohort comprised all residents aged 45–85 years who resided in metropolitan Vancouver during the exposure period and without known CHD at baseline (n = 450,283). Residential proximity to traffic was estimated using a geographic information system. CHD deaths during the follow-up period were identified using provincial death registration database. The data were analyzed using logistic regression.

Results: Compared with the subjects consistently living away from road traffic (>150 m from a highway or >50 m from a major road) during the 9-year study period, those consistently living close to traffic (≤150 m from a highway or ≤50 m from a major road) had the greatest risk of CHD mortality (relative risk [RR] = 1.29 [95% confidence interval = 1.18–1.41]). By comparison, those who moved closer to traffic during the exposure period had less increased risk than those who were consistently exposed (1.20 [1.00–1.43]), and those who moved away from traffic had even less increase in the risk (1.14 [0.95–1.37]). All analyses were adjusted for baseline age, sex, pre-existing comorbidities (diabetes, chronic obstructive pulmonary disease, hypertensive heart disease), and neighborhood socioeconomic status.

Conclusions: Living close to major roadways was associated with increased risk of coronary mortality, whereas moving away from major roadways was associated with decreased risk.

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SDC Supplemental digital content is available through direct URL citations in the HTML and PDF versions of this article (www.epidem.com).

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A growing body of epidemiologic evidence has demonstrated that long-term exposure to ambient air pollution, especially fine particles, is associated with increased cardiovascular morbidity and mortality.[1,2] Several cohort studies suggest that coronary heart disease (CHD) is more strongly associated with fine particulate air pollution than are other cardiovascular outcomes.[3,4] In metropolitan areas, road traffic is a major contributor to air pollution.[5,6] A European study estimated that approximately half of the adult mortality from air pollution was attributed to traffic-related air pollution.[7] Because exposure to traffic-related air pollution is extensive worldwide, the corresponding adverse cardiovascular effects may represent an important public health problem.[1]

The concentrations of traffic-related air pollutants decrease exponentially from major roadways and typically approach background concentrations within about 150 meters.[6,8] The distances from residences to major roadways may therefore reflect spatial variability in the concentrations of traffic-related air pollutants. Although traffic proximity may also be associated with other exposures such as traffic noise, it can serve as a simple and policy-relevant surrogate for exposure to traffic-related air pollution.[9,10] This metric has been widely used in epidemiologic studies of the health effects of traffic-related air pollution.[9–19]

There have been a number of epidemiologic studies examining the associations between residential proximity to traffic and adverse cardiovascular outcomes including arterial atherosclerosis[11,12] and CHD morbidity and mortality.[13–19] Although most of these studies have reported associations, the findings are not entirely consistent. One critical limitation of these studies is the assumption that baseline residential exposure status is consistent during the entire follow-up period; residential relocation after baseline enrollment has generally been ignored. This unrealistic assumption may

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result in exposure misclassification, and thus bias effect estimates toward the null.

We conducted a large population-based cohort study with detailed residential history information to investigate the association between residential proximity to road traffic and the risk of CHD mortality. Specifically, we examined the following factors: (1) whether residential proximity to traffic was associated with higher levels of exposure to traffic-related air pollution; (2) whether living close to traffic was associated with an increased risk of CHD mortality; and (3) whether changing residences, and therefore changing proximity to traffic, was associated with an altered risk of CHD mortality.

METHODS

Study Design

This population-based cohort study was conducted in metropolitan Vancouver, Canada. We used linked administrative databases from British Columbia's universal health insurance system to assemble a population-based cohort (eAppendix, http://links.lww.com/EDE/A405). This study included 2 stages: a 5-year exposure period (January 1994–December 1998), and a 4-year follow-up period (January 1999–December 2002). Mortality information during the follow-up period was identified from the provincial death registration database. CHD mortality was compared between study subjects with different residential-traffic-exposure profiles to determine the relationship between residential proximity to road traffic and the risk of CHD mortality. This study was approved by the institutional review board of The University of British Columbia.

Study Cohort

All metropolitan Vancouver residents who met the following criteria at baseline (January 1999) were included in the cohort: (1) registered with the provincial health insurance plan, which provides universal coverage to the resident population; (2) age 45–85 years; and (3) without previous diagnosis of CHD. A small number (4%) of study subjects who moved to other regions of the province during the 5-year exposure period were included, all other subjects remained in the study region during the exposure period.

Residential Proximity to Road Traffic

We categorized residential proximity to traffic based on individual residential histories (eAppendix, http://links.lww.com/EDE/A405), and whether a 6-digit residential postal code (area centroid) was located within 50 m or 150 m of a highway or a major road during the 5-year exposure period and the 4-year follow-up period. The study subjects were divided into 4 groups:

1. Not exposed to traffic: consistently living away from traffic until the end of follow-up;
2. Consistent exposure to traffic: consistently living close to traffic until the end of follow-up;
3. Moved close to traffic: changing residence from nonexposed to exposed to traffic during the exposure period and retaining this exposure status until the end of follow-up;
4. Moved away from traffic: changing residence from exposed to nonexposed to traffic during the exposure period and retaining this nonexposure status until the end of follow-up.

Subjects with more than one change in exposure status during the exposure period were excluded; those who changed their exposure status during the follow-up period were also excluded.

Depending on road types (highway or major road) and distance from major roadways, residential proximity to traffic was divided into 5 categories: (1) ≤50 versus >50 m from a highway; (2) ≤150 versus >150 m from a highway; (3) ≤50 versus >50 m from a major road; (4) ≤150 versus >150 m from a major road; (5) ≤150 m from a highway or ≤50 m from a major road versus >150 m from a highway or >50 m from a major road. Subjects living within a specific distance were assigned to the exposure group, while the rest were assigned to the nonexposure group (eAppendix, http://links.lww.com/EDE/A405).

Traffic-related Air Pollution Assessment

We used high-resolution land-use regression models to evaluate exposure levels to traffic-related air pollutants. Because the air pollution measurements did not cover the whole study region, air pollution data were available only for a subgroup of the cohort.

Using detailed residential history and corresponding monthly concentrations of traffic-related air pollutants during the 5-year exposure period, average concentrations of air pollutants were calculated for each subject. Detailed methods for the measurement of air pollutants in this study have been described elsewhere.[20,21] A brief description of traffic-related air pollution assessment is available in the eAppendix (http://links.lww.com/EDE/A405).

Coronary Heart Disease Mortality

A case of CHD death was defined as a death record in the provincial death registration database with CHD (ICD-9 codes 410–414, 429.2 and ICD-10 codes I20–I25) as the cause of death. A small proportion of deaths were identified using provincial hospitalization records: a hospitalization death record with CHD as the principal diagnosis for a hospital admission.

Subjects who had a hospitalization record with CHD as the principal or primary diagnosis before baseline (on the basis of data available from January 1991 to December 1998) were regarded as previously-diagnosed CHD cases, and were excluded from the analysis.

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Pre-existing Comorbidities

Chronic obstructive pulmonary disease (COPD)[22] (ICD-9: 490, 491, 492, 496; ICD-10: J40–J44), diabetes[23] (ICD-9, 250; ICD-10, E10–E14), and hypertensive heart disease[23] (ICD-9: 401–404; ICD-10: I10–I14) are independent risk factors for CHD. In addition, these chronic diseases and CHD share common behavioral risk factors such as cigarette smoking. In an effort to control the influence of the pre-existing comorbidities and these common behavioral risk factors, all diagnoses (not restricted to principal or primary diagnosis) in a hospitalization record were used to identify subjects with these comorbidities. One hospitalization record with the diagnosis of any of these diseases during January 1991 to December 1998 was defined as the presence of pre-existing comorbidities.

Neighborhood Socioeconomic Status

Individual-level income data were not available in this study. We used neighborhood-income quintiles from the 2001 Statistics Canada Census data to approximate a subject's socioeconomic status (SES). Neighborhood-income quintiles were assigned to study subjects through their residential postal codes (eAppendix, http://links.lww.com/EDE/A405).

Statistical Analysis

We compared the baseline characteristics among the exposure groups using a χ^2 test for dichotomous variables, one-way analysis of variance (ANOVA) for continuous variables, and Tukey's post hoc analysis for pair-wise comparisons of continuous variables. Similarly, in a subgroup analysis for the subjects with air pollution data, we used ANOVA and Tukey's post hoc analysis to determine whether residential traffic-exposure profiles were associated with exposure levels to traffic-related air pollutants.

To determine the association between residential proximity to traffic (predictor variable) and the risk of CHD mortality (dependent variable), we first performed bivariable logistic regression analysis using the nonexposed group as the reference category. Then we performed multivariable logistic regression analysis to adjust for age (quintiles), sex, neighborhood income (quintiles), and pre-existing comorbidities including diabetes, COPD, or hypertensive heart disease (yes or no). These analyses were repeated for different combinations of road types (highway or major road) and distances (50 or 150 m).

To examine the influence of age and sex on the risk of CHD mortality associated with traffic exposure, we performed stratification analyses by age (<65 years, ≥65 years) and sex, using the exposure category ≤150 m from a highway or ≤50 m from a major road.

The exposure category "≤50 versus >50 m from a highway" had the largest effect estimates. We therefore used this category to perform a sensitivity analysis in which we compared the relative risks of CHD mortality using various distances from a highway and various frames of reference.

All analyses were performed using SAS 9.1 (SAS Institute Inc., Cary, NC).

RESULTS

We use the road traffic exposure category "≤150 m from a highway or ≤50 m from a major road versus >150 m from a highway or >50 m from a major road" to present the overall results of this study. At baseline in January 1999, there were 488,785 subjects who met the inclusion criteria. At the end of follow-up, 38,502 persons (8%) were lost to follow-up, mainly due to moving out of the province or dying from other diseases. This left 450,283 subjects with complete data; 210,128 persons (47%) changed their residences at least one time during the 9-year study period, and 68,726 persons (15%) changed their exposure status. We excluded 12,619 persons (3%) with multiple changes in exposure status and 22,871 (5%) who changed their exposure status during the follow-up period. This left 414,793 subjects for analysis: 328,609 (79%) who consistently lived away from traffic, 52,948 (13%) who consistently lived close to traffic, 15,747 (4%) who moved close to traffic, and 17,489 (4%) who moved away from traffic (Table 1).

The baseline characteristics of these subjects are summarized by the 4 exposure groups in Table 1. Fewer than half (46%) of the subjects were male; the average age (SD) was 59 (11) years (range, 45–83 years). Overall, compared with those consistently living away from traffic, persons who consistently lived close to traffic were older and more likely to have lower neighborhood SES and pre-existing comorbidities.

Based on the land-use regression data that incorporated high spatial resolution, persons who consistently lived close to traffic were exposed to elevated concentrations of black carbon, $PM_{2.5}$, NO_2, and NO during the 5-year exposure period (Table 2). Furthermore, those once living close to traffic were also exposed to higher concentrations of black carbon, NO_2, and NO; this increment was even larger for those who moved their residences close to traffic.

During the follow-up period, 3133 people (3097 from the death registration database and 36 from hospitalization records) died of CHD, for an overall mortality rate of 7.6 per 1000 subjects. Compared with subjects consistently living away from traffic, those consistently living close to traffic were 69% (95% confidence interval [CI] = 1.55–1.85) more likely to die of CHD during the follow-up period. For those who moved away from traffic during the exposure period, there was a 4% increase in the risk of CHD mortality (0.87–1.25) during the follow-up period compared with the unexposed. For those moving closer to traffic during the exposure period, the risk of CHD mortality increased 23% (1.03–1.46) as compared with the unexposed. Adjustment for

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TABLE 1. Baseline Characteristics[a] of Study Subjects by Exposure Groups[b]

	Not Exposed to Traffic (n = 328,609)	Moved Close to Traffic (n = 15,747)	Moved Away From Traffic (n = 17,489)	Consistent Exposure to Traffic (n = 52,948)
Men	46	46	47	45
Age (years); mean (SD)	58.7 (10.4)	58.6 (10.2)	57.6 (10.0)	61.0 (10.9)
Age quintiles (years)				
45–48	19	19	21	15
49–53	22	21	23	18
54–60	21	21	21	19
61–69	20	21	20	22
70–83	19	18	15	26
Comorbidity				
Diabetes	1.9	2.1	2.0	2.5
COPD	1.0	1.2	1.2	1.5
Hypertensive heart disease	3.7	4.0	3.9	4.6
Any of the above	5.6	6.4	6.1	7.2
Income quintiles[c]				
1	15	25	20	27
2	18	19	19	20
3	19	21	20	19
4	22	18	22	16
5	26	17	20	19

[a]Percent, unless otherwise specified.
[b]Traffic exposure was defined as ≤150 m from a highway or ≤50 m from a major road.
[c]Quintile 1 represents the lowest and Quintile 5 the highest neighborhood income quintile.

TABLE 2. Average Concentrations of Traffic-related Air Pollutants by Exposure Groups

	Not Exposed to Traffic (n = 306,296) Mean (SD)	Moved Close to Traffic (n = 13,285) Mean (SD)	Moved Away From Traffic (n = 14,582) Mean (SD)	Consistent Exposure to Traffic (n = 50,502) Mean (SD)
Black carbon (10^{-5}/m)	1.1 (0.7)	2.3 (1.1)	1.9 (0.9)	3.0 (1.5)
$PM_{2.5}$ ($\mu g/m^3$)	4.0 (1.6)	4.2 (1.6)	4.1 (1.6)	4.3 (1.8)
NO_2 ($\mu g/m^3$)	31.3 (7.9)	33.9 (7.5)	33.0 (7.6)	35.5 (7.9)
NO ($\mu g/m^3$)	28.8 (8.2)	39.5 (13.4)	34.8 (10.7)	45.9 (16.6)

This is a sub-group analysis for the subjects (93%) with land-use regression data. Traffic exposure was defined as ≤150 m from a highway or ≤50 m from a major road.

baseline age, sex, pre-existing comorbidities, and neighborhood SES generally reduced the relative risks but did not change the overall pattern of the results: the risk of CHD mortality increased by 29% (1.18–1.41), 14% (0.95–1.37), and 20% (1.00–1.43), respectively, for those consistently living close to traffic, moving away from traffic, and moving close to traffic, respectively (Table 3).

Similar CHD mortality patterns were observed when the analysis was repeated using different road types and distances (Table 3, Fig. 1). Figure 1 shows that the risk of CHD mortality was strongly dependent on road types (traffic volume) and the distances from major roadways. For example, for those consistently living close to traffic, the risk of CHD mortality rapidly decreased when the distance from traffic increased from 50 to 150 m, or when road type changed from a highway (21,000–114,000 vehicles/day) to a major road (15,000–18,000 vehicles/day). Overall, compared with consistently living away from traffic, consistently living close to traffic was associated with the highest risk of CHD mortality (Fig. 1); moving closer to traffic was associated with an increased risk but lower risk compared with consistently living close to traffic. Moving away from traffic was associated with a decreased risk but higher risk compared with consistently living away from traffic.

For those consistently living within 150 m from a highway or 50 m from a major road (vs. consistently living >150 m from a highway or >50 m from a major road), the risk of CHD mortality was higher for men than for women and higher for the younger (<65 years) than for the older group (≥65 years) (Fig. 2).

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TABLE 3. Association of Road Traffic Exposure With Coronary Heart Disease Mortality

Exposure Category	Not Exposed to Traffic[a]	Moved Close to Traffic	Moved Away From Traffic	Consistent Exposure to Traffic
≤150 m Highway or ≤50 m major road				
No. deaths/total number	2271/328,609	131/15,747	124/17,489	607/52,948
Crude RR (95% CI)	1.00	1.23 (1.03–1.46)	1.04 (0.87–1.25)	1.69 (1.55–1.85)
Adjusted RR (95% CI)[b]	1.00	1.20 (1.00–1.43)	1.14 (0.95–1.37)	1.29 (1.18–1.41)
≤50 m Highway				
No. deaths/total number	3164/434,602	26/2304	21/2729	73/4343
Crude RR (95% CI)	1.00	1.55 (1.05–2.29)	1.05 (0.69–1.62)	2.33 (1.84–2.94)
Adjusted RR (95% CI)[b]	1.00	1.44 (0.97–2.13)	1.09 (0.71–1.69)	1.54 (1.21–1.96)
≤150 m Highway				
No. deaths/total number	2851/397,341	59/7016	62/8484	257/20,085
Crude RR (95% CI)	1.00	1.18 (0.91–1.53)	1.02 (0.80–1.32)	1.80 (1.59–2.05)
Adjusted RR (95% CI)[b]	1.00	1.22 (0.94–1.59)	1.11 (0.86–1.44)	1.36 (1.19–1.55)
≤50 m Major road				
No. deaths/total number	2674/370,505	90/10,534	88/12,935	330/31,073
Crude RR (95% CI)	1.00	1.20 (0.97–1.48)	0.95 (0.77–1.18)	1.49 (1.33–1.67)
Adjusted RR (95% CI)[b]	1.00	1.16 (0.93–1.43)	1.07 (0.86–1.33)	1.15 (1.02–1.29)
≤150 m Major road				
No. deaths/total number	1752/247,483	157/19,724	170/25,781	1024/112,093
Crude RR (95% CI)	1.00	1.17 (1.00–1.38)	0.97 (0.83–1.14)	1.35 (1.25–1.46)
Adjusted RR (95% CI)[b]	1.00	1.24 (1.05–1.46)	1.09 (0.93–1.28)	1.11 (1.02–1.19)

The total number of subjects in each traffic exposure category is different due to exclusion of subjects with multiple changes in exposure status and subjects who changed their exposure status during the follow-up period.

[a]Reference category.

[b]Adjusted for age, sex, neighborhood socioeconomic status, and pre-existing comorbidities.

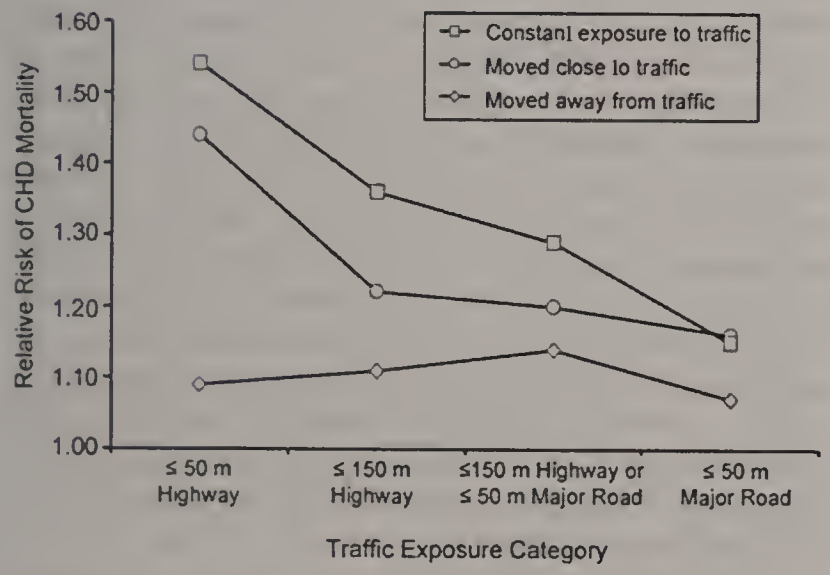

FIGURE 1. Association of road traffic exposure with coronary heart disease mortality by road types and distances. RRs adjusted for age, sex, neighborhood SES, and pre-existing comorbidities.

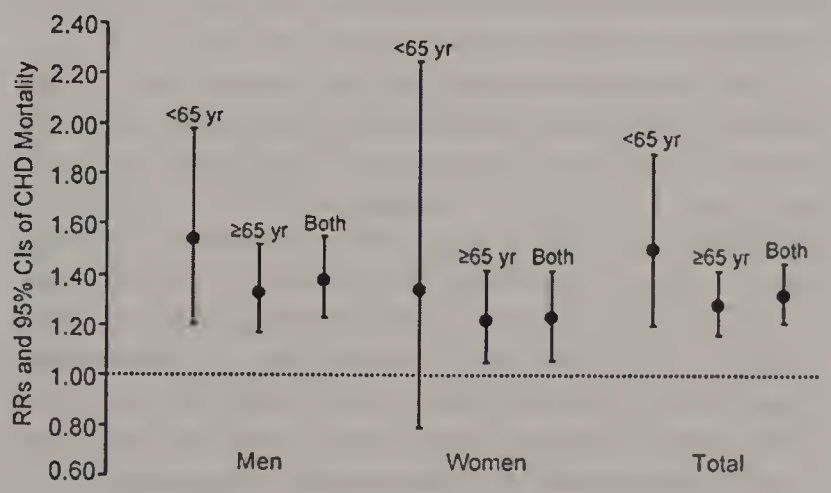

FIGURE 2. Association of road traffic exposure with coronary heart disease mortality by sex and age (traffic exposure was defined as ≤150 m highway or ≤50 m major road). Adjusted for neighborhood SES and pre-existing comorbidities; the combined analyses ("Both") were additionally adjusted for age (<65 years, ≥65 years); for the total group, the analyses were additionally adjusted for age (<65 years, ≥65 years) and sex.

In the sensitivity analysis examining the effects of distances and reference groups, for those who moved away from traffic during the exposure period, the effect estimates were very close among the 3 groups (Fig. 3). However, for those who moved close to or consistently lived close to traffic, the effect estimates changed in response to different distances and references used in the analysis, indicating that the observed association between residential proximity to traffic and the risk of CHD mortality was sensitive to distances from highways and the references used for comparison.

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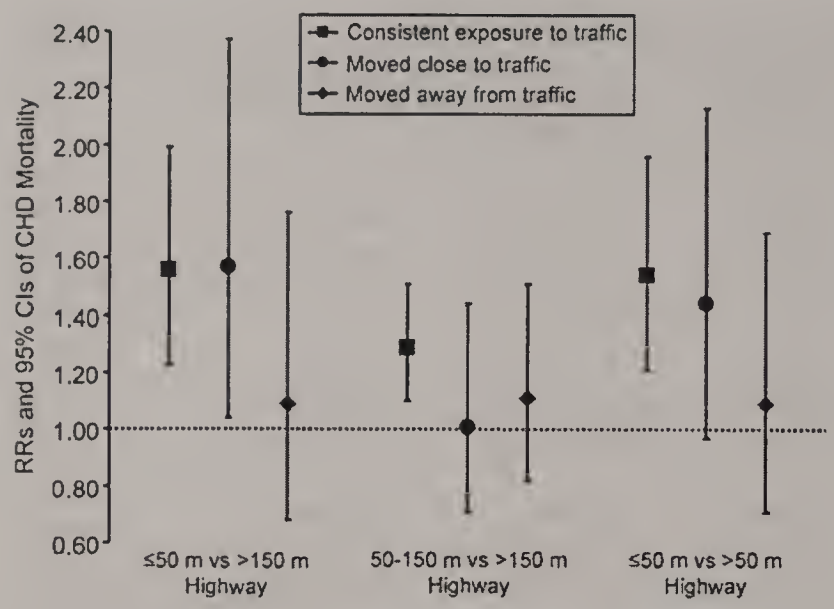

FIGURE 3. Association of road traffic exposure with coronary heart disease mortality by distances from highways. Adjusted for age, sex, neighborhood SES, and pre-existing comorbidities.

DISCUSSION

In this large population-based cohort study with detailed residential-history information, living close to road traffic was associated with an increased risk of CHD mortality. More importantly, a change in residential proximity to traffic was associated with an altered risk of CHD mortality: moving close to traffic was associated with a relatively increased risk, whereas moving away from traffic was associated with a relatively decreased risk.

Previous studies examining the associations between residential proximity to traffic and cardiovascular outcomes have not reported entirely consistent findings. A cross-sectional study carried out in Germany with 4494 participants found that living close to a major road was associated with more severe coronary artery calcification.[11] In contrast, a recent study with 1147 participants in the United States found no appreciable association between residential proximity to a major road and abdominal aortic calcification.[12] In a 13-year cohort study of 13,309 people in the United States, Kan et al[13] found that residential traffic intensity was associated with an increased risk of fatal and nonfatal coronary events. Similarly, in a large case-control study, Tonne et al[14] reported that living near a major road was associated with a 5% increase in the risk of acute myocardial infarction. A 13-year cohort study of 4800 women in Germany also found that living within 50 m of a major road was associated with increased cardiopulmonary mortality.[15] In contrast, in a 9-year Dutch cohort study with 117,528 participants, Beelen et al[16] did not find an association between residential proximity to a major road or residential traffic intensity and cardiovascular mortality. Several studies have also reported associations between exposures to traffic-related air pollutants such as nitrogen oxides and adverse cardiovascular outcomes.[17–19] Because of differences in traffic characteristics, study populations, meteorological and geographic conditions, study design, and statistical methods, it is difficult to quantitatively compare the results from different studies. Although the findings from these previous studies are not fully consistent, the present study and most previous studies suggest that residential proximity to traffic is associated with increased risk of CHD mortality. Traffic-related air pollution and other factors such as traffic noise may be responsible for the observed association.

Compared with previous reports, this study has several important strengths: First, this population-based cohort study may be regarded as a natural experiment in which we took advantage of detailed residential histories to investigate the relationship between changes in traffic exposure status and the risk of CHD mortality. Changes in residential proximity to traffic were associated with an altered risk of CHD mortality in an exposure-response fashion.

Second, we used various road types (highway or major road) and distances (≤50 or ≤150 m) from major roadways to assess residential proximity to traffic. The observed association was consistent across various combinations of road types and distances. The effect estimate was dependent on road types (traffic volume) and distances in a dose-response fashion (Table 3, Fig. 1).

Third, residential proximity to traffic was consistent with land-use-regression-model estimates for the concentrations of black carbon, nitrogen dioxide (NO_2), and nitric oxide (NO) (Table 2). These results are consistent with those of previous studies, and suggest that residential proximity to traffic is a simple and specific surrogate that reflects spatial variability of traffic-related air pollution.[5,6] In a separate analysis of associations between these 4 pollutants and the risk of CHD mortality, we found that an interquartile range elevation in the concentrations of black carbon was associated with a 6% (95% CI = 1.02–1.09) increase in the risk of CHD mortality after adjustment for all the covariates and 3 other copollutants ($PM_{2.5}$, NO_2, and NO); the corresponding relative risk for $PM_{2.5}$, NO_2, and NO was 1.00 (0.97–1.04), 1.04 (1.00–1.09), and 1.02 (0.97–1.08), respectively (Gan WQ, Koehoorn M, Daves HW, Demers PA, Tamburic L, Brauer M. Submitted paper).

Fourth, this study found that 47% of study subjects changed their residences at least once during the 9-year study period, leading to a change in the residential traffic exposure status in 15% of the subjects. When residential proximity to traffic at the original address (January 1994) was used to evaluate traffic exposure status (and subsequent residential relocations were ignored), the corresponding adjusted RRs (95% CI) for the 5 exposure categories were: 1.19 (1.10–1.29), 1.34 (1.10–1.64), 1.27 (1.13–1.42), 1.09 (0.99–1.21), and 1.06 (0.99–1.14) (Table 3, from the first to the fifth row). Thus, previous studies that have not accounted for residential relocation may have suffered from substantial exposure mis-

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classification. This may result in underestimations of the true adverse health effects, and even false-negative results.

This study had several limitations that should be considered when interpreting these findings. The study cohort was constructed using linked administrative databases that did not include certain important information about individual cardiovascular risk factors (such as active or passive smoking status, body mass index, and individual SES). To partially control for these unmeasured risk factors, we adjusted for age, sex, neighborhood SES, and pre-existing comorbidities including diabetes, COPD, and hypertensive heart disease. Because these comorbidities and CHD share common behavioral risk factors, adjusting for these pre-existing comorbidities was presumably able to reduce the influence of uncontrolled factors, such as cigarette smoking, to some extent.[24] However, these approaches cannot eliminate all confounding effects caused by unmeasured cardiovascular risk factors.

Cigarette smoking is the single most important risk factor for CHD.[25] If smokers are more likely to live near (or move closer to) major roadways, the observed association may be confounded by the effects of cigarette smoking. However, previous epidemiologic studies have demonstrated that the association of air-pollution exposure with the severity of atherosclerosis[11,26] or the risk of CHD mortality[3,27] was independent of cigarette-smoking status and even stronger among never-smokers.[3,11,26,27] For example, Pope et al[3] reported that for each 10 $\mu g/m^3$ increase in annual average concentration of $PM_{2.5}$, the adjusted relative risk of CHD mortality was 1.22 for never smokers, 1.15 for former smokers, and 1.16 for current smokers. Given these findings and the lack of evidence to suggest that cigarette smoking is related to changes in residential proximity to traffic, it is less likely that the observed associations were due to confounding effects of cigarette smoking.

Low SES is a risk factor for CHD[28] and is also related to other cardiovascular risk factors such as cigarette smoking, obesity, and hypertension.[29–31] In some locations, people with low SES are more likely to live close to major roadways.[32] Individual SES is thus a possible confounder for the observed association. In the present study, we used neighborhood-income quintiles to approximate the major differences of economic status between subjects with various traffic-exposure profiles. Although this method may induce a degree of SES misclassification, some evidence has suggested that this approximation is acceptable for group comparisons.[33] In addition, some studies have found that neighborhood SES is associated with the risk of CHD independent of individual SES, indicating that adjustment for neighborhood SES may also reduce the influence of uncontrolled factors related to neighborhood disadvantages.[31] We used neighborhood income quintiles derived from the 2001 census data, which may not accurately reflect the original neighborhood SES for subjects who changed their residences during the exposure period (January 1994–December 1998). Nevertheless, there is evidence that the levels of neighborhood SES are well correlated for those who change their residences.[31]

Residential proximity to traffic is a relatively crude surrogate for exposure to traffic-related air pollution. Many factors, such as wind direction, presence of street canyons, and specific residence characteristics, may influence actual residential exposure levels.[34,35] Moreover, in the present study, residential proximity to traffic was estimated using the postal code centroid rather than the actual residential address. In urban areas, a 6-digit postal code typically represents one side of a city block or individual multiunit structures and is therefore fairly precise. Still, this assessment of traffic proximity will inevitably induce exposure misclassification. Furthermore, as in previous studies, our exposure assessment can only approximately reflect the exposure levels at subjects' residences, which may not precisely reflect actual individual exposure levels. Mobility,[36] outdoor activity, and indoor infiltration of air pollutants[37] may differ across study subjects. Nevertheless, all these factors presumably cause nondifferential exposure misclassification, leading to underestimations of the true adverse effects of residential proximity to traffic.

Finally, residential proximity to traffic signifies exposure not only to traffic-related air pollutants but also to traffic-related noise. Some studies have indicated that traffic-noise levels are at least moderately correlated with the concentrations of nitrogen oxides[38] and also with increased risk of CHD.[39] Therefore, it is possible that the increased risk of CHD mortality observed in the present study may be associated with both traffic-related air pollution and traffic noise. We cannot disentangle the effects of these 2 traffic-related pollutants in the current analysis.

An enormous number of people are regularly exposed to traffic; therefore, traffic-related air pollution may represent an important public-health problem. Using a large population-based cohort study with detailed residential history information, we observed that living close to traffic was associated with an increased risk of coronary mortality, whereas moving away from traffic was associated with a decreased risk.

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WZ.1 **Contaminated soil.**

Chapter 8 of the DEIR discusses the anticipated approaches to achieve a level of No Significant Risk on applicable sites. Specifically, the assessment and remediation approaches are outlined for each Block in the following sections: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7 Block: 8.8.3. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. In certain instances, installation of protective barriers may be used to cap contaminated soil. In such instances, the barrier will be separated from the underlying layers by a geotextile or other similar material to provide a visual marker and to separate the upper clean materials from the lower contaminated soil. In paved or hardscaped areas, the barrier will be a minimum of one-foot thick consisting of clean soil, base material and the pavement or concrete surface finish. Use of protective barriers to achieve and maintain a level of No Significant Risk will require the recording of an AUL that demonstrates where the barriers are located and describes the required maintenance of the barrier. In cases where existing AULs are present, construction will be performed in a manner that is consistent with the AULs.

Matthew Beaton, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office / MEPA Analyst Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Via email to Mr. Alex Strysky
RE: EEA#15889, ENF, Union Square Redevelopment, Somerville MA

Secretary Beaton,

I am a resident of Union Square, and also serve as the co-chair of the Union Square Neighborhood Council, and a member of Fossil Free Somerville. I would like to write in opposition to the proposed Phase 1 Waiver for the Union Square Redevelopment.

There are numerous reasons to oppose this waiver. The legacy of industrial uses in the D2 parcel alone suggests that a thorough environmental impact review is necessary to ensure the health of the land and groundwater. Samples taken from the D2 parcel in 2010 found several carcinogenic contaminants within 3 feet of soil. Current sampling should re-evaluate the presence and concentration of these contaminants, and the proper method for remediation. This review is key to ensure the protection of our groundwater, and the future health of those inhabiting the living, work and civic spaces. RW.1

The increased projected use of the D2 parcel extends beyond Phase 1, and the transportation and infrastructure analyses should reflect this. In conjunction with the introduction of the Green Line to Union Square, the development of lab and living spaces will increase the already-congested Prospect Street. The Proponent has passed the threshold for the EIR in terms of vehicle trips and parking, which translates to increased air pollution to the proposed civic space adjacent to Prospect Street. If this space is to be truly civic, environmentally sound and enjoyable, it should be protected from city congestion, not central to it. RW.2 RW.3

Finally, the impacts of climate change will be significant, and thorough examination of mitigation for flooding from storm events is critical. The City's Climate Change Vulnerability Assessment (CCVA) highlights the whole of Union Square as vulnerable to flooding. The current drainage infrastructure (while being upgraded) does not have adequate adaptive capacity to handle the increased severity of storms caused by climate change. Further, the consideration of natural gas infrastructure alongside the lack of commitment to renewable energy do not suggest contribution to the City's objective for carbon neutrality in 2050. RW.4 RW.5

To conclude, I oppose the waiver and I would recommend full environmental review for Phase 1 of the Union Square Redevelopment.

Sincerely,
Rachel J. Weil
Union Square Neighborhood Council, Co-chair
Fossil Free Somerville, Member

RW.1 **Contamination.**

Chapter 8 of the DEIR discussed the anticipated approaches to achieve a level of No Significant Risk on applicable sites. Specifically, the assessment and remediation approaches are outlined for each Block in the following sections: D1 Block: 8.2.3, D2 Block: 8.3.3, D3 Block: 8.4.3, D4 Block: 8.5.3, D5 Block: 8.6.3, D6 Block: 8.7.3, and D7 Block: 8.8.3. For each D Block, a specific strategy will be developed based on the available assessment data following the completion of environmental due diligence. The strategy will define the scope of remediation that must be completed to achieve and maintain a level of No Significant Risk. In certain instances, installation of protective barriers may be used to cap contaminated soil. In such instances, the barrier will be separated from the underlying layers by a geotextile or other similar material to provide a visual marker and to separate the upper clean materials from the lower contaminated soil. In paved or hardscaped areas, the barrier will be a minimum of one-foot thick consisting of clean soil, base material and the pavement or concrete surface finish. Use of protective barriers to achieve and maintain a level of No Significant Risk will require the recording of an AUL that demonstrates where the barriers are located and describes the required maintenance of the barrier. In cases where existing AULs are present, construction will be performed in a manner that is consistent with the AULs.

RW.2 **Transportation and infrastructure of D2.**

Chapter 4 of the DEIR included a TIA for the Project at full build out. Chapters 9 and 10 of the DEIR provided information on stormwater, wastewater and water infrastructure for the Project at full build out. The TIA provides intersection capacity results for all study area intersections for the 2025 Build Condition for the a.m., p.m., and Saturday peak periods and is consistent with standard TIA guidelines.

RW.3 **Air pollution.**

In direct response to these community comments, US2 has improved the D2 design by increasing the size of the plaza by more than 33% and has also added a new publicly-accessible green space of approximately 2,300 sf on D2 near the MBTA station platform. In addition, the plaza has been widened to create greater horizontal separation from Prospect Street vehicles. The elevation of the plaza has also been set at approximately the same elevation as the adjacent Union Square Station allowing the southern 150 feet of the plaza to benefit from being approximately seven vertical feet below Prospect Street. The largest portion of the plaza, where people are most inclined to congregate, is at the southern end of D2 and benefits from the most vertical separation from Prospect Street (approximately 10 to 14 vertical feet). A vegetated landscape buffer has also been planned between the Prospect Street sidewalk and the main pedestrian areas of the plaza to further separate main pedestrian areas on the plaza from the vehicles.

US2 believes that it is important for the community and the Project to create a welcoming, enjoyable civic open space on D2.

RW.4 Flooding.

Chapter 9 of the DEIR provided information about existing and proposed storm drain infrastructure, as well as stormwater management. Lastly, Section 1.2.2, page 1-24 of the DEIR, Streetscape and Infrastructure Improvements, included additional details about the City's expansion of neighborhood stormwater infrastructure and the Project's contributions to that effort.

Stormwater management facilities will be implemented on a Lot-by-Lot basis and will conform to all Stormwater Management Standards within the Massachusetts Stormwater Handbook to the maximum extent practicable. These on-site mitigation measures will decrease the peak rate of runoff for all storms up to and including the 100-year storm event. By doing so, these on-site measures will provide relief to the existing (and proposed) City of Somerville infrastructure that currently experiences surcharge and flooding during large scale storm events.

The Project will include a number of additional low impact development measures, where feasible and practicable. Residential buildings are anticipated to incorporate both blue and green roof technology to temporarily store stormwater, combined with rain water harvesting for irrigation. Permeable pavement will be substituted for traditional asphalt pavement in areas to promote infiltration and groundwater recharge. Additionally, rain gardens will be constructed in pervious areas to promote water quality treatment and groundwater recharge.

RW.5 Renewable energy and natural gas.

US2 has been working with Solect Energy to study the solar potential of the Project and to advise the developer of solar opportunities and considerations early in the planning process. Solect has identified solar-ready zones on many of Project rooftops, where it makes the most sense to locate future photovoltaic installations. Please refer to Section 3.5 of the FEIR for additional information.

US2 is committed to reducing Project GHG emissions to the maximum extent feasible. Through the MEPA process, US2 has evaluated various building envelop and system designs in an effort to reduce GHG emissions within Project buildings as outlined in the FEIR, including both partial and full electrification of buildings and Passive House design. It also is anticipated that as the State Building and Energy Codes become more stringent, future buildings will also be more efficient, as they will be required to meet the Building Code at the time of building permit issuance. Commitments to mitigate stationary source GHG emissions have been made in the FEIR. Please refer to Section 3.6 of the FEIR.

Beyond the modeled approaches to understand the benefits of electrification in reducing emissions included in the FEIR, US2 has consulted with engineers in the market to understand feasibility of implementation. It is readily understood that product type and scale factor considerably in feasibility which has resulted in a scarcity of large-scale, project precedents in the market. Similarly, the New England climate presents real challenges for Variable Refrigerant Flow (VRF) systems to support 100% outside air. VRF efficiencies in tempering heat unfortunately do not correlate with like successes in handling the 0 degree or 98% saturated outside air extremes our climate can present. Provided these limitations and parallel demands for the significant coolant needs of large buildings, application of VRF systems could be implemented as a supplemental cooling source, in lieu of fan coils for example. In this mode, the benefit of providing for both heating and cooling is lost – compromising the efficiency intended of the product. The end result necessitates more system infrastructure within the building, further expanding costs and complexity in operations. In spite of these current challenges, the technology to make large-scale VRF applications more viable is advancing.

It is anticipated that partial electrification will be incorporated into future building designs; however, it is not possible for US2 to commit to a specific HVAC technology at this time. The barriers to implementation paired with uncertainty around end users and their future needs suggest a commitment of this kind, absent evolutions in technology, would preclude Life-Science tenants from the anticipated lab buildings, compromising the unique market opportunity available to Somerville and US2 to establish Union Square as the City's commercial center. Notwithstanding these difficulties, the FEIR contains a thorough analysis of the application of electric systems across Union Square's building types. Please refer to Section 3.3 of the FEIR for details. US2 will continue to evaluate partial and full-electrification on a case by case basis as building projects are implemented.

Strysky, Alexander (EEA)

From: Malcolm Cummings <malcolm.cummings@gmail.com>
Sent: Friday, August 24, 2018 4:43 PM
To: Strysky, Alexander (EEA)
Subject: RE: EEA#15889, ENF, Union Square Redevelopment, Somerville MA

Friday August 24, 2018

Matthew Beaton, Secretary

Executive Office of Energy and Environmental Affairs
Attn: MEPA Office / MEPA Analyst Alex Strysky
100 Cambridge Street, Suite 900
Boston MA 02114

Via email to Mr. Alex Strysky

RE: ***EEA#15889, ENF, Union Square Redevelopment, Somerville MA***

Dear Secretary Beaton,

The proponent US2 and SRA are requesting a phase 1 waiver for the Union Square Redevelopment in Somerville MA. I am deeply concerned that this waiver would eliminate the capacity of the community to fully understand the environmental impact of the development until after construction has begun or been completed. The waiver should not be granted.

The carbon footprint of this development must be minimized and well understood. Granting the waiver will eliminate an important step in this process. The greenhouse gas emission analysis has not adequately quantified MC.1
the impact of this development, nor does the proposed design take sufficient measures to avoid, minimize or mitigate the emissions. The outright rejection of building orientation as a method of energy efficiency gains is a very unfortunate design choice on the part of the proponent. Building orientation can significantly impact the passive heating and cooling performance of a building by optimizing sun exposure to various design features. This is particularly important in how the orientation of the Phase 1 development may impact design elements of the later phases of construction. Granting a Phase 1 waiver will allow construction to proceed before we understand the impact on later phases.

The proponent does not have detailed construction drawings and is unable to commit to a high-performance building envelope to improve heating energy efficiency. A high-performance building envelope is necessary for this development to achieve low carbon emissions, especially in the absence of passive thermal efficiency associated with building orientation as mentioned above. Changes to a building envelope after construction has begun or been completed are often prohibitively costly. A waiver should not be granted in the absence of a detailed analysis of and commitment to a high-performance building envelope.

Ultimately, a LEED Gold rating is completely insufficient for a building to reach zero carbon emissions by 2050 (Somerville's stated goal) without major retrofitting in the near term. There are many other design options for designing and analyzing a building of this scale, including passive house performance standards, that have not been evaluated by the proponent. The Proponent has not used all the resource available to minimize

greenhouse gas emissions and should not receive a waiver. The community and commonwealth would be best served by not granting this waiver.

Sincerely,

Malcolm Cummings
Fossil Free Somerville

MC.1 GHG analysis.

Chapter 7 of the DEIR included a GHG analysis that complies with the MEPA Greenhouse Gas Emissions Policy and Protocol (GHG Policy) of May 2010, and includes information about building envelopes and other measures to reduce the Project's GHG emissions. US2 modeled the Project, as well as three alternatives for each building type, and also evaluated nearly 40 stationary source GHG mitigation measures involving design parameters, technologies, and construction and operating parameters to inform US2 regarding what feasible measures may be implemented to reduce GHG emissions. US2 understands the benefits of building orientation; however, in a dense urban environment, building orientation is limited by urban geometry.

As part of the FEIR update, all buildings have proposed building envelopes that exceed prescriptive code levels. Please refer to Section 3.2 of the FEIR for details.

Passive House is a building standard for ultra-low energy buildings that focuses on air tightness and a super-insulated building enclosure. Passive House principles are proposed in current designs across the Project. Section 3.4 and Appendix E of the FEIR contains a thorough Passive House Analysis of the mid-rise multi-family residential and hotel buildings. This study demonstrated that Passive House can produce energy benefits, but also come at significant cost and risk given the nascent market. Through the MEPA process, US2 has come to understand the importance of establishing a Passive House market to the state, the City and the Somerville community. As such, despite the cost and risks associated with the design and construction of a Passive House building, US2 has committed to building D4.3 as a Passive House multi-family project. In addition, US2 will consider Passive House for future residential buildings in the Project.

To: Secretary Matthew Beaton, Energy and Environmental Affairs
Via: Alex Strysky, MEPA Office, 100 Cambridge St Suite 900, Boston, MA
From: Anson Stewart, 27 Adrian Street, Apt. 1, Somerville, Mass
Mike Firestone, 97 Prospect Street, Unit 4, Somerville, Mass
Date: August 24, 2018
RE: EEA No. 15889 – US2 and City of Somerville Phase 1 Waiver for Union Square

We are Somerville residents generally inclined to support expediting dense, mixed-use, affordable, transit-oriented development. For this waiver to be granted, however, the proponents must demonstrate that "the potential impacts of phase one, taken alone, are insignificant," 301 CMR 11.11(4)(a). For the reasons outlined below, we believe the proponents fail to demonstrate that the potential traffic impacts of Phase One are insignificant.

Equally, for a waiver to be granted, the proponents must demonstrate that "the Project is severable, such that phase one does not require the implementation of any other future phase of the Project or restrict the means by which potential environmental impacts from any other phase of the Project may be avoided, minimized or mitigated, 301 CMR 11.11(4)(c). For the reasons outline below, we believe that US2 cannot make such a showing.

Finally, it is our belief that any determination of severability is inconsistent with the intent of the City of Somerville and the Somerville Redevelopment Authority as detailed in the Master Development Designation Agreement[1] and the Master Land Disposition Agreement.[2] These public bodies entered into an agreement to designate US2 as the Master Developer of 15 acres of Union Square, including the D2 block, "to accomplish the revitalization of Union Square" through a comprehensive project-wide strategy, and not a parcel-specific one. To move forward with a Phase 1 waiver in our view meaningfully limits environmental impact mitigation through the consideration of alternatives to *only* those achievable on the individual parcel. As described below, we believe that US2, at a minimum, must consider project alternatives to achieve mitigation that leverages its unique scale and acreage as Master Developer.

We accordingly believe that a Phase One waiver is not warranted, and that if it is granted, should be subject to strict conditions related to transportation and exploration of mitigation alternatives outside the D2 block.

Traffic Generation Significance Thresholds:

MEPA uses two relevant average daily trips (ADT) thresholds to gauge the significance of traffic impacts (301 CMR 11.6). Projects generating more than 3,000 ADT are subject to a mandatory EIR, and projects generating more than 2,000 ADT are subject to Other MEPA Review if the Secretary So Requires.

Following basic Institute of Transportation Engineers ("ITE") trip generation methodology, the first estimate of ADT generated by Phase 1 is 4,968. US2's Transportation Impact Study ("TIS") adjusts this value downward significantly.[3] While the general use of such an adjustment process is appropriate given

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[1] Available at http://unionsquareneighborhoodcouncil.org/images/resources/US2-Union-Square-Master-Developer-Designation-Agreement.pdf
[2] Available at https://www.somervillema.gov/sites/default/files/US2%20-%20Union%20Square%20Master%20Land%20Disposition%20Agreement%20-%202.16.17.PDF
[3] The TIS calculates an estimated number of person trips (6,217), then divides these person trips using assumed mode shares to arrive at an adjusted value ADT of 2,089 vehicle-trips.

the project context, the proponents' methodology and assumptions should be subject to rigorous scrutiny. We wish to note three concerns:

1. *The analysis presumes a reduction in vehicle usage that has not occurred*

   The city's representative at the MEPA site visit stated US2 had made a "binding commitment" to achieve a 60% mode share target (i.e. up to 40% of person trips made by automobile). US2 states that this commitment is to be achieved through a mobility management plan, but further details are lacking. To their credit, the proponents do admit that the mobility management plan may not be effective in achieving traffic reduction targets, but their failure to analyze the full level of potential traffic generation inhibits an informed discussion of the magnitude of such impacts. AS.1

2. *Using inappropriately aggressive mode share values*

   The 40% target for automobile mode share is a laudable aspiration, and we sincerely hope the project will meet it. But in considering the waiver application and for public consideration of environmental impacts, a more conservative estimate is warranted. More appropriate mode shares for estimating ADT could be derived from current neighborhood automobile mode shares (66%, as calculated from TIS Table 6) or the city's comprehensive plan (50%, as noted at the site visit). The ADT values corresponding to these more conservative assumptions are 4,103 and 3,109. AS.2

3. *Double-counting internal trips*

   The use of an "internal capture" rate to reduce ADT by an additional 15% is also dubious. Presumably, trips within the D2 block would be walking trips, already accounted for in the 60% non-auto share. If the "internal capture" rate is applied to trips taken by automobile, as the TIS numbers suggest, it implies that more than 300 daily trips are made *driving within* the Phase 1 site. Double counting should not be allowed. AS.3

In short, while reducing ADT to 2,089 or below corresponds with environmentally laudable goals, it is arguably inappropriate as a Phase 1 traffic generation value for MEPA purposes; ADT estimates based on appropriately conservative assumptions (e.g. 3,109, as described above) present a more accurate picture of the potential impacts.

Finally, even if one accepts the adjusted ADT value of 2,089 at face value, the Phase 1 project on its own exceeds an identified trip threshold in 301 CMR 11.6(b), which simply cannot be determined an "insignificant" impact under the Phase 1 Waiver rules, 301 CMR 11.11(4)(a).

MEPA Conditions:

Thorough MEPA review requires an informed consideration of alternatives and potential mitigation of project impacts. The Secretary should not grant proponents' waiver request until there has been such consideration. We suggest the following:

1. *Less parking on the D2 block, move parking to D1*

   Locating the hulking D2 parking structure, with the proposed 290 parking spaces, immediately adjacent to the Green Line station, puts vehicular traffic in conflict with pedestrians and bicyclists accessing the station. In particular, the TIS estimates 144 vehicles per peak hour

turning between Prospect Street and the proposed Driveway 2 at Intersection 15, which most passengers using the Green Line Station would be forced to confront.

Excerpt of Figure 33: 2025 Build AM Peak Hour Traffic Volume

To mitigate these conflicts, the proponent should analyze alternatives with less total parking, and with some of the proposed D2 parking moved across Somerville Avenue to D1. The D1 block is much better suited to parking -- it already has vehicular access from Somerville Avenue and Washington Street, and it is more convenient to regional commuters using McGrath Highway. The premise of the Master Development Designation Agreement is that parcels are not developed in isolation. Indeed, the best alternatives for mitigating transportation impacts will likely involve creative and synergistic uses of the different sites in Union Square. For example, the ENF references "the ability to manage parking supply and demand in a flexible, rational and innovative manner to balance transportation," and the proponents repeatedly mentioned "shared parking" in the site visit. AS.4 AS.5

In short, we believe a Phase 1 waiver should not be granted without full analysis of the environmental benefits of reduced parking and of shifting parking to the D1 parcel or other sites under control of US2. Allowing the waiver without such consideration is inconsistent with 301 CMR 11.11(4)(c)) and the goals of the Master Development Designation Agreement.

2. *Assess alternatives for Intersection 15*

The Prospect/ Everett intersection (Intersection 15) will interact substantially with congestion from the saturated Somerville/ Washington/ Prospect intersection (Intersection 13) and warrants rigorous attention. As shown in the figure above, the TIS estimates 98 (78 + 20) vehicles per AM peak hour making left turns between Prospect Street and Driveway 2. These turning movements would be subject to impedance from not only pedestrians walking on Prospect St (e.g. to/from the Green Line Station), but also northbound traffic on Prospect Street.

Table 51 in the TIS omits LOS and delay estimates for this northbound traffic, which is part of the Prospect St NB LTR approach to Intersection 13. The no-build AM peak volume/capacity ratio for this approach is 1.21 (Table 47). The build alternative increases this ratio to 1.42 (Table 52). Traffic generated by Phase 1 increases this delay by 89 seconds, bringing the delay for vehicles approaching Intersection 13 on Prospect St NB to nearly 4 minutes. Exceeding capacity for this approach by 42% is likely to cause ripple effects throughout the area. Vehicle queues on Prospect St NB will severely impede left turns at Intersection 15; with only one combined lane for LTR movements from Prospect St SB, vehicles waiting for a gap to turn left to Driveway 2 will block through traffic, which could easily spill back and block Intersection 13. The TIS estimates that the average delay for Prospect St SB at Everett St. is 2.5 seconds, but provides no details on the pedestrian impedance values, gap acceptance process, or platoon dispersion process from the upstream Intersection 13 signal used to calculate this value.

The proponent should provide a more thorough explanation of assumptions used to calculate impacts at these critical intersections, and analyze alternative designs for Intersection 15 (e.g. with left turns between Prospect St SB and Driveway 2 prohibited). AS.6

3. *Do not preclude, and consider providing, bus improvements as part of the MBTA Better Bus Project or other initiatives*

The proponents' transportation consultant expressed the hope that the MBTA's phased Better Bus initiative would improve bus service in the area. The proponent should coordinate with the MBTA to ensure that the development of Phase 1 does not negatively affect current or planned bus service. Plans for maintaining and improving access to the existing CT2 stop on Prospect St. NB should be detailed. Furthermore, the MBTA will consider route changes as part of this initiative, possibly including re-routing 91 and CT2 service from Sullivan Square to continue straight onto Prospect Street SB, rather than turning right onto Somerville Ave at Intersection 13. Given projected traffic delays at Intersections 13 and 15, discussed above, passengers on these buses, as well as routes along Somerville Ave affected by a blocked intersection, would be faced with substantial delays. The proponent should consider concrete bus priority infrastructure that would mitigate these delays. AS.7

Conclusion:

The D2 site presents a unique opportunity to add new development adjacent to a new transit station, but without careful planning and consideration of project-wide environmental mitigation, the project is unlikely to achieve the City's and the Commonwealth's environmental goals.

Thank you for your thoughtful consideration of our concerns.

Sincerely,

Anson Stewart
949.202.9329
ansonstewart@gmail.com

Mike Firestone
617.733.8005
mikefirestone@gmail.com

AS.1 Traffic analysis.

The TIA included in Chapter 4 of the DEIR was prepared based on guidance from MassDOT and the City, and is consistent with MassDOT's *Transportation Impact Assessment Guidelines* (2014). The Project includes MMPs that will be enforceable and will be intended to ensure that vehicle trips are reduced to the extent practicable. A MMP will be developed for each building as part of the DSPR requirements as buildings are advanced for permitting.

AS.2 Mode share.

US2 is committed to minimizing vehicle use by maintaining a robust TDM program to achieve the 60% non-vehicle mode share defined in the DEIR, agreed to in the CDSP and its existing MMP, and consistent with recent zoning, *SomerVision*, and the Union Square Neighborhood Plan.

In combination with proposed pedestrian and bicycle improvements, close proximity to public transit services, and inherent walkable characteristics of the Union Square neighborhood, the Project has been developed consistent with area goals and guidelines to take advantage of, promote and maximize non-auto travel. Included in Chapter 5 of the FEIR is an overview of the programs and commitments of the Project towards meeting these goals. Similarly, the management of D2 modes are depicted in greater detail on Figure 1-9 in the FEIR.

AS.3 Internal capture rate.

The DEIR trip generation/mode share analysis was coordinated with the City as part of the overall analysis. Trip generation was conducted using nationally accepted trip generation rates from the ITE Trip Generation Manual, 10th edition. Person trips generated via this manual were modified according to the average vehicle occupancy rate observed in Union Square by the U.S. Census. Census-based mode share data was used to distribute site-generated trips across modes, and a TDM factor was applied to reach an ultimate future non-vehicle mode share of 60%. Based on guidance from the City, it was assumed that 15% of trips should be removed from the vehicle analysis due to internal capture, with the remaining entering and exiting trips being distributed across the roadway network for analysis.

AS.4 Less Parking

Section 4.5.6 of the DEIR described the proposed parking supply and management for the Project established following the Union Square Neighborhood Plan and recent zoning. The Project seeks to provide parking that serves the proposed development and

adjacent neighborhood without incentivizing driving, and that is as efficiently utilized as possible in order to meet the goals of the Union Square Neighborhood Plan.

As described in Section 2.3 of the FEIR, the basis of the parking demand model used by US2 to evaluate the shared parking strategy described in the DEIR is the City's parking demand estimator which was used to estimate potential parking demand for the Project based on the proposed program of office/lab, retail, hotel, and residential uses.

The Project is required by the City to adhere to the shared parking strategy that was agreed to with the City through the Project's CDSP. The DSPR for each Lot must demonstrate adherence to the overall parking management policy developed, including sharing parking in one facility amongst the multiple uses in the specified Blocks. In addition, the zoning for the Project site and the CDSP were both developed with an overall cap on parking supply to minimize the attractiveness of driving and support the multi-modal transportation goals outlined in the Union Square Neighborhood Plan.

AS.5 Parking Location

Vehicular entrances to each of the parking garages will be located off of the pedestrian streets to minimize the number of points of pedestrian and car intersection. The proposed parking garage locations were selected as part of the master planning process to maximize the opportunity for shared parking, thereby reducing the number of parking spaces that would be required in connection with the development of the Project. The largest parking facilities were located on the largest Blocks (D1, D2 and D3) and at the edge of the neighborhood in order to 'intercept' cars and reduce vehicle trips through the heart of the neighborhood. Each of the parking structures that are located on designated pedestrian streets (i.e., Washington Street, Somerville Avenue, Prospect Street, Bow Street and Webster Street) will be lined with non-parking uses to ensure a vibrant and pedestrian friendly streetscape.

AS.6 LOS and delay estimates.

Analysis of vehicular, transit, pedestrian and bicycle travel was completed in coordination with the City and MassDOT and to the extent possible incorporates roadway and intersection improvements planned by the City. The DEIR describes this level of incorporation which further recognizes that US2 has committed overall funding and ongoing cooperation with efforts to further allow the City to determine the success of implemented measures and modify as needed.

The DEIR (Section 4.5.2, Table 4-25) provides the results of a Pedestrian Level of Service (PLOS) analysis. The methodology used for the PLOS analysis is provided in Section 2.1 of the FEIR. This analysis demonstrates that in the future Build Condition, the PLOS at Intersection 15 (Prospect Street at Newton Street) is forecast to be LOS C for the a.m., p.m., and Saturday peak periods.

As the Project phases are implemented, US2 will continue to work with the City and the MBTA to identify and implement additional transit, bicycle and pedestrian mitigation measures. The Project will be built over time and US2 is committed to a robust multimodal monitoring program which will be developed on a Lot-by-Lot basis through ongoing city permitting processes.

To advance these potential additional mitigation measures, the Project will be contributing over $35 million towards mitigating Project impacts and addressing City and community priorities. In addition to the approximately $5.8 million for the GLX project, the Project is providing approximately $4.5 million in inflow and infiltration payments, approximately $10.9 million in housing linkage, approximately $2.9 million in jobs linkage, approximately $3.8 million for a community benefits fund, and approximately $3.6 million for other City and community needs.

AS.7 Coordination with MBTA.

The DEIR includes a detailed transit analysis following the express guidance of MassDOT and the MBTA, per their request.

US2 is committed to working with all parties, particularly the City and the MBTA, to ensure transit access to Union Square as part of larger overall goals of minimizing auto travel and meeting or exceeding mobility management requirements. While the MBTA controls improvements to their system, US2 has committed to the following improvements to improve access and provide needed facilities for Union Square Station and will carefully provide for construction coordination:

- US2 will contribute $5.8 million to support the GLX development.
- US2 will provide on the D2 property improvements to Union Square Station including the following end of line facilities: operator's breakroom, accessible restrooms, janitor's closet, and The Ride paratransit service drop-off area.
- A permanent easement in favor of the MBTA, for construction and operating, a portion of the GLX Union Square Station on a portion of the D2 site.
- ADA pedestrian path from Union Square Station to the Prospect Street sidewalk to improve pedestrian access to transit.

US2 has also offered land area on D2 to make room for the MBTA's elevator and/or to install a stair to help improve vertical circulation between the station and the Prospect Street bridge. US2 has also offered to assist in paying for the cost of installing the MBTA elevator. US2 will continue to coordinate with the MBTA, the City and other stakeholders on this issue.

The overall impact of Project-generated bus trips, through the course of a day, relative to the Comfort Metric established through the MBTA's Service Delivery Policy, predicted up to 15 additional bus runs will exceed the MBTA's load factor at some point. These are out of a total of over 800 overall runs occurring daily in the Study Area. One third of these potential impacts may occur solely within the study area and may be due to the conservative trip assignment analysis.

The City has been working continuously with the MBTA on potential improvements to its roadway network that may benefit transit operations. US2 has been supportive of those efforts. The City has both the ability and the willingness to attempt additional interventions to benefit transit. To fund these potential improvements, the City will allocate a portion of US2's committed offsite infrastructure and future phase contribution monies to rapid-response, short-term mobility and safety retrofits in the Project area to use as deemed necessary. In addition, through the individual plans for each parcel, US2 will work with the City on potential transit improvements proximate to each parcel. Ongoing monitoring programs will also provide information and data about transit use and operations within the context of larger operations within Union Square and will be used to help determine future improvements or the success of ones previously implemented.

Public Benefit Determination

PUBLIC BENEFIT DETERMINATION

Introduction

Portions of the D2 and D3 Blocks are located within landlocked tidelands which are exempt from licensing requirements under the provisions of Chapter 91, Section 18(b) and 310 CMR 9.04(2). Historic tidelands on-site are entirely separated by public ways from flowed tidelands and do not lie within 250 feet of the high-water mark. Therefore, pursuant to 310 CMR 9.02, the filled tidelands are categorized as landlocked tidelands that are not subject to Chapter 91 licensing requirements.

In November 2007, the Massachusetts House and Senate passed An Act Relative to the Licensing Requirements for Certain Tidelands (HB 4324), which was signed by Governor Patrick on November 15, 2007 (Chapter 168 of the Acts of 2007, codified as MGL, c.91, §18B) (the "Landlocked Tidelands Legislation"). The Landlocked Tidelands Legislation, among other things, names the Secretary of EEA as the "administrator of tidelands," and requires the Secretary of EEA to conduct a "public benefit review" for certain projects on landlocked tidelands and to issue a written determination (the "Public Benefit Determination") for these projects. Specifically, under 301 CMR 13.02(1), the Secretary must conduct a public benefit review for any proposed project for which an ENF is filed after November 15, 2007 where the project is completely or partially located on landlocked tidelands and where the project requires an Environmental Impact Report. Chapter 91, Section 18(b)(ii) and 301 CMR 13.00 establishes the procedures and standards to implement the requirements of the Landlocked Tidelands Legislation.

Under the Landlocked Tidelands Legislation, in making the Public Benefit Determination, the Secretary of EEA shall consider the following:

> "Purpose and effect of the development, the impacts on abutters and the surrounding community; enhancement to the property, benefits to the public trust rights in tidelands or other associated rights, including but not limited to, benefits provided through previously obtained municipal permits; community activities on the development site; environmental protection and preservation; public health and safety; and the general welfare; provided further that the secretary shall also consider the differences between tidelands and landlocked tidelands and great ponds when assessing the public benefit and shall consider the practical impact of the public benefit on the development."

The Landlocked Tidelands Legislation and related regulations require analysis of a project's impacts on the public's rights of access, use and enjoyment of tidelands that are protected by Chapter 91, and identification of measures to avoid, minimize, and mitigate any adverse impacts on such rights. Significant portions of the site will be opened to public access, and the public will be encouraged to take advantage of the site by the incorporation of recreational amenities. The environmental impacts associated with the Project, as described herein, have been avoided and minimized, and will be mitigated as necessary.

The D2 and D3 Blocks are located more than a mile from both the Charles and Mystic Rivers, with dense urban development in between the site and rivers. Given their location, no impacts to the access, use and enjoyment of tidelands protected by Chapter 91 are anticipated. To assist with the Secretary's determinations, the following sections address the specific considerations identified in the Landlocked Tidelands Legislation, and describe how the D2 and D3 Blocks provide appropriate public benefits and is adequately protective of the Public Trust rights inherent in tidelands.

Purpose and Effect of the Development

The D2 and D3 Blocks will help bring to fruition years of community planning for Union Square. The adoption of *SomerVision* in 2012 as the City's first-ever comprehensive plan set in motion a framework for future planning efforts that would transform designated 'opportunity areas', one of which is Union Square, while conserving great residential neighborhoods and enhancing commercial corridors. Envisioned as a guide for future growth and development in the city, the master plan articulated over 500 goals, policies and actions that the City and future partners should consider on topics ranging from transportation, housing, economic development and neighborhood preservation.

In May 2015, the Somerville Planning Board adopted the Union Square Neighborhood Plan after an 18-month community-based planning process that focused on implementing *SomerVision* at the neighborhood scale. The award-winning plan provides a 20+ year strategic direction for the 400-acre Union Square neighborhood. Through the exploration of policy approaches for capturing the community benefits envisioned through *SomerVision* (for an employment center, housing alternatives, the creation of open space, and non-automobile trips), the Neighborhood Plan provided programmatic aspirations for each of the D Blocks. Perhaps most inventive, it reimagined the public realm, converting existing rights-of-way into complete streets that prioritized pedestrians and cyclists over vehicles. These ambitions at the community level were subsequently codified with the adoption of the Union Square Zoning Overlay District - directly informing the program as described here.

Consistent with *SomerVision* and the Union Square Neighborhood Plan, the D2 and D3 Blocks are proposed for redevelopment on sites that include landlocked tidelands into a transit-oriented development with a mix of uses, including new publicly accessible civic space, and retail, commercial and residential uses, including affordable housing. The Project will also create new roadways and pathways to improve circulation.

Impact on Abutters and the Surrounding Community

The development of the D2 and D3 Blocks will benefit abutters and the surrounding community by transforming an underutilized urban site into a dynamic, transit-oriented, mixed-use neighborhood. The D2 and D3 Blocks are part of the larger Union Square Neighborhood Plan that will transform Union Square into a vibrant economic center and continue the revitalization of Union Square. The Project has gone through a multi-year community process which has

resulted in the rezoning of the area to specifically allow for the proposed development. US2 was approved for a Special Permit that included the development of proposed mitigation and a public benefits package, including extensive new open spaces, new circulation patterns, new affordable housing and new economic activity. US2 collaborated with the City, the Board of Alderman and community members to develop a robust community benefits approach for the Project that is organized around a range of neighborhood goals, including job creation, developing the local workforce, assisting local businesses, building affordable housing, improving new open space, pursuing sustainable development, improving transportation and infrastructure, bolstering social capital, enhancing community resilience, and mitigating displacement. The Project will be anchored by a new high quality civic space system and be directly serviced by mass transportation including the MBTA Green Line.

In addition, the redevelopment of the D2 and D3 Blocks will result in significant new construction jobs and permanent jobs. The permanent jobs will range from professional, technology and life sciences opportunities, to arts and creative pursuits to service jobs and part-time. US2 will also fund jobs linkage payments that will support local workforce development initiatives.

Enhancement to the Property

The redevelopment will enhance the D2 and D3 Blocks by transforming underutilized, industrial property into a vibrant and transit-oriented urban employment center. The D2 site has been cleared and partial remediation has occurred. D3 is partially vacant and partially occupied by a commercial laundry. As part of the redevelopment, US2 will complete remediation of the site, making it suitable for development. This cleanup activity and the resultant development on the D2 Block and D3 Block, including open space, connections to the new Union Square Station, new retail space, commercial/lab space and residential units, will be a significant improvement over the existing and previous heavy industrial conditions.

Benefits to the Public Trust Rights in Tidelands or Other Associated Rights

The D2 and D3 Blocks are separated from the waterfront by more than a mile and several public rights-of-way, and will not impede either waterfront access or waterfront open space. Moreover, the redevelopment of the D2 and D3 Blocks will not interfere with lateral movement—either landside pedestrian movement or waterside navigation. In fact, the redevelopment of the D2 and D3 Blocks will result in substantial improvements to public benefits in tidelands, as summarized below:

- The redevelopment of the D2 and D3 Blocks will result in a substantial net improvement to community activities at the site by providing significant new publicly accessible open space.
- New thoroughfares will provide access through the D2 and D3 Blocks, improving circulation, and providing a connection to the new Union Square Station.

- In addition to new housing, the Project will provide new facilities of public accommodation that will bring residents and visitors to the area and provide an active streetscape, new services and employment opportunities to those already living nearby.

- Provision of new shoppers, (new residents and employees of new businesses) will help strengthen local retail in Union Square. In addition, development of street front retail will help activate the street frontage and some of the new open space, broaden the existing retail mix, and augment the character and scale of retail in what will become a strong downtown district for Somerville.

- The Project includes new pedestrian and bicycle accommodations and connections to adjacent neighborhoods.

Community Activities on the Development Site

As noted above, the redevelopment of the D2 and D3 Blocks will result in a substantial net improvement to community activities at the site by providing significant new publicly accessible open space, as well as arts and creative enterprise space.

Environmental Protection and Preservation

The redevelopment of the D2 and D3 Blocks will transform an underutilized site with access to public transportation and will provide new publicly accessible open space. The D2 and D3 Blocks do not contain significant natural resources or existing publicly protected open space or parkland.

Transportation

The Union Square Neighborhood Plan envisioned and recommended a series of infrastructure changes and anticipated development that would work together to create a vital, active neighborhood surrounding the extended MBTA Green Line and re-establishing Union Square as a pre-eminent, transit-oriented urban employment center in Somerville. The City of Somerville has been proactive in implementing and establishing many of the proposed infrastructure changes, including conversions of streets from one-way to two-way, upgrading traffic signals, adding dedicated bicycle facilities, expanding pedestrian access and improving the overall streetscape in and around Union Square. The Union Square Neighborhood Plan process considered development at a larger scale, including the Project described in the DEIR, development of Boynton Yards as well as other large and infill sites, and the multimodal transportation plan associated with it was built on this expanded program. While the scale of the Project will produce additional bicycle, transit, pedestrian and vehicle trips, the overall impact is well within that considered in the adopted Union Square Neighborhood Plan.

Moreover, all aspects of the Union Square Neighborhood Plan, including the redevelopment of the D2 and D3 Blocks, will be designed in a way that minimizes vehicle impacts and builds the

integrated, multimodal future of Union Square. The D2 and D3 Blocks border the new Union Square Station on the north and south sides, and five current MBTA bus routes have stops within Union Square. The full Project will include a mix of uses, including residential, commercial/lab, and retail, which will allow for numerous basic services and amenities to be within walking distance of residents and workers in the area.

The extension of the Green Line to Union Square will serve as a catalyst for the Project, and will further promote walkability by reducing the prevailing reliance on personal vehicles. To support the Green Line, US2 has committed to make significant capital contributions toward the GLX project and will also fund the construction of critical elements of the station's operation within the D2 Block. In order to minimize impacts to the surrounding transportation network, multiple new thoroughfares are planned within the D2 and D3 Blocks, which will allow access to parking, loading and service areas. Equal access to the regional transit system will be ensured through ADA access to the station as well as a drop-off designated for the MBTA's The Ride paratransit program on the D2 Block. Streetscape improvements, together with an expanded right-of-way interfacing with Somerville Avenue and Prospect Street, will also increase mobility. Integrating bike lanes onto the sidewalk at the D2 Block's north end will provide increased safety and transit efficiency by further distancing the mode away from vehicles. Consistent with *SomerVision*'s goal of new trips through transit, cycling, or walking, the thoughtful integration of the Green Line coupled with new public ways of generous size and utility will serve the pedestrian first—providing ease of access to transit, consumer experiences and to places of employment.

The redevelopment of the D2 and D3 Blocks will also include the implementation of a mobility management plan that will serve to increase the attractiveness and practicality of other modes of transport, while reducing the demand for and use of cars.

Groundwater and Stormwater Management

The redevelopment of the D2 and D3 Blocks includes new pervious area and landscaped area that will promote stormwater retention and minimize stormwater runoff from the site. The cleanup of the D2 Block will also improve subsurface conditions.

Leadership in Energy and Environmental Design (LEED)/Sustainable Design

The Project's impacts will be minimized in part through its LEED certifiability at the Gold level for the six buildings greater than 50,000 sf on the D2 and D3 Blocks.

US2 has also committed to a number of measures to mitigate environmental impacts, including stormwater retention, a transportation demand management program, and water conservation measures. In addition, the building systems will be designed to optimize energy performance and reduce energy consumption consistent with energy requirements at the time the building permit is issued.

Public Health and Safety

Upon completion of site remediation and development activities, the transformation of these underutilized sites will create activity throughout the day and into the evening. Complemented by the inclusion of new publicly accessible open spaces, streetscaping and pedestrian walkways, the area surrounding the D2 and D3 Blocks will create a more pedestrian-friendly environment for individuals walking to and through the site. Streetscape improvements including lighting, landscaping, and curbing will encourage walking and enhance overall safety. In addition, the provisions for bicycle parking and proximity to multiple modes of public transportation both help to improve public health and safety. The design of D2 and D3 Blocks will incorporate universally accessible design features into building and landscape plans.

General Welfare

The redevelopment of the D2 and D3 Blocks will improve the general welfare of the public by providing improved access to public transportation, enhanced infrastructure capacity, and other redevelopment-related benefits.

Conclusion

The redevelopment of the D2 and D3 Blocks meets the requirements of the Landlocked Tidelands Legislation by providing appropriate public benefits, and adequately protecting the public trust rights inherent in tidelands as described herein. By transforming underutilized urban sites into a pedestrian friendly development, the redevelopment of the D2 and D3 Blocks will increase the vibrancy and connectivity within the surrounding area, which will be an improvement over existing conditions.

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